The Business Magazine for Makers & Users of Chemicals

Management, Research, Production, Marketing

CHEMICAL INDUSTRIES

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Volume 47 Number 2

AUGUST, 1940

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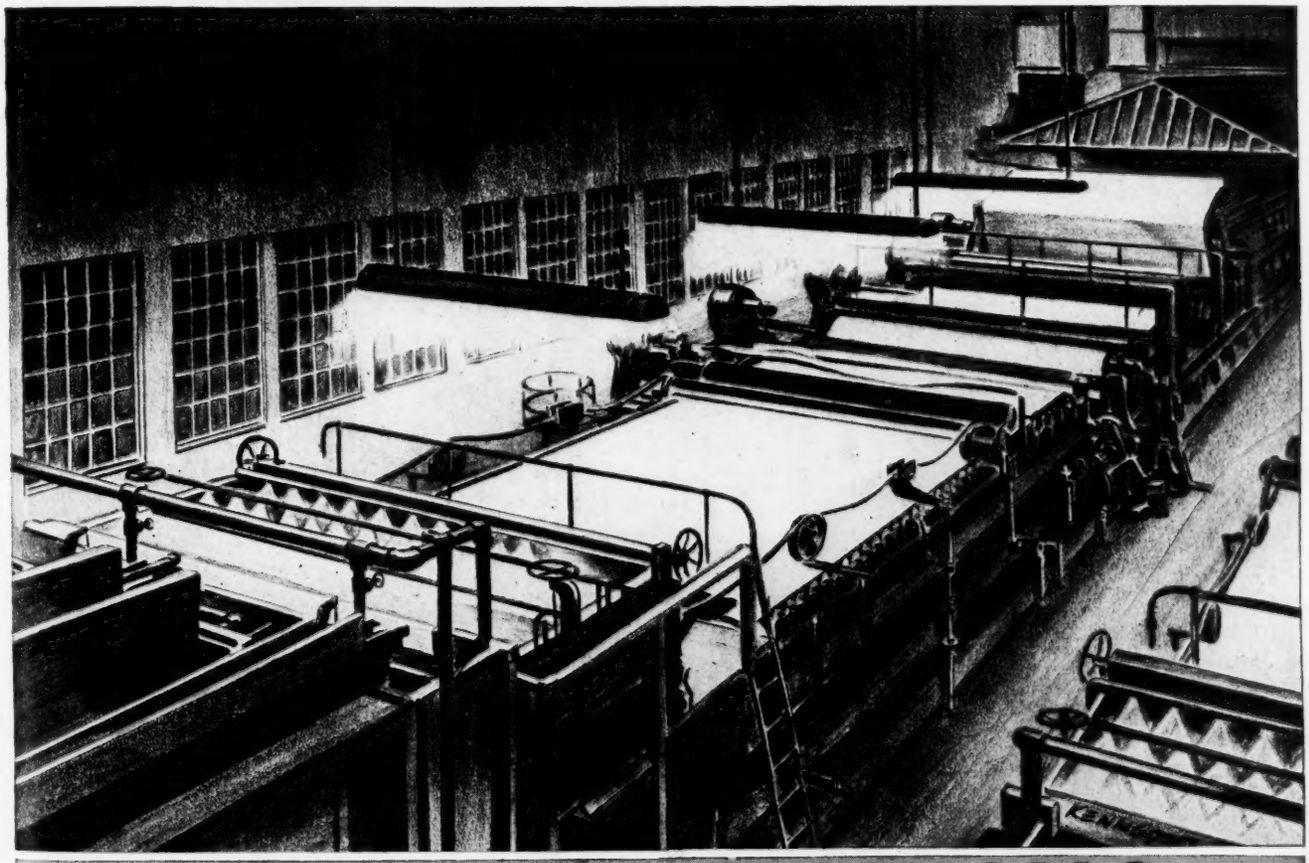
"PRINTED IN U.S.A."

Suppose some one who lived forty or fifty years ago—say one of the founders of Mathieson—could pay us a visit today. And suppose we could have the pleasure of showing him the sights of 1940, of explaining the vast changes that have taken place since the turn of the century. What do you think would amaze the old gentleman most? If he were one of the pioneers who founded Mathieson, we believe he would be most interested in the revolutionary changes wrought by chemical progress and in the part his successors have played in building the present-day America. We would go about telling him the story as we tell it in this series of advertisements.

● **Yes, Mr. M., more than 19,000 periodicals were published in the United States last year, and hundreds of thousands of advertising mailing pieces, catalogs, etc. were printed and issued. Millions of pages of information, entertainment, ideas and critiques—reflections of this nation's thoughts and hopes. All of this consumed over 4,000,000 tons of white paper. Add the millions of tons of Kraft paper now produced annually and you have some idea of the amazing progress that has been made in recent years by this country's great paper industry—progress as noteworthy in quality as in quantity.**

Your successors here at Mathieson are proud of the fact that Mathieson Chemicals—liquid chlorine, caustic soda, soda ash, synthetic salt cake—have played and continue to play so important a part, from cooking liquor to finished bleached pulp, in the great American paper industry.



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THE MATHIESON ALKALI WORKS (INC.)
60 E. 42ND STREET, NEW YORK, N. Y.

The Reader Writes—

Your Senators and Congressmen

The writer has read with a great deal of interest, your editorial on "One Man Direction of the Defense Commission," as appearing in the July number of CHEMICAL INDUSTRIES.

We agree with you 100 per cent. that inefficiency has cost this country millions and millions of dollars, but I certainly believe when it comes to defense preparation it should be taken out of the hands of politicians and entrusted to capable, efficient, and honest men who will see that we get what we pay for and promptly.

If you have any suggestions as to whom we could write to, or wire, we will be very glad to have a letter from you and will cooperate in every way possible.

S. L. ABBOT, *President*,
S. L. Abbot, Jr., Co.,
San Francisco, Calif.

Editorial Note: To other readers who have voiced similar expressions of opinion we suggest that they communicate at once with their senators and congressmen.

Again "The Executive and the Technologist"

I have read with great interest the article entitled "The Executive and the Technologist" in your March edition of CHEMICAL INDUSTRIES. If you have any reprints of this article I request that you send three of them to The Williams Manufacturing Company, marked to the attention of the writer, and bill us in the usual manner for the cost involved.

W. J. STEWART,
The Williams Manufacturing Co.,
Portsmouth, Ohio.

Editorial Note: Last three of our reprints of the outstanding debate between Mr. Bell, President of American Cyanamid, and Dr. E. C. Williams, Vice-President, Shell Development, went to Reader Stewart.

More on "Strategic" Chemicals

I was very much interested in "The Pulse of Opinion" this month giving the views of outstanding executives as to the future trend in certain of the more important chemicals and raw materials, particularly those which we are partially or entirely dependent upon outside sources for adequate supplies. What pleased me most and impressed me most was that none of those who contributed to the symposium dealt in mere platitudes, but gave a straightforward statement and did not hesitate to tell the plain truth no matter how unpleasant.

As you did not cover all of the materials that should be reviewed, I suggest that you do so in a very early issue.

ARTHUR K. PURVIS,
Oakland, Calif.

Editorial Note: It is the intention of the editors to follow Reader Purvis' suggestion in the September issue.

From a New Reader

I have only had an opportunity to read the first issue you sent me, but wish to compliment you and your publication on the vast amount of interesting and valuable reading matter contained therein.

GEO. K. MANCHE,
Meatene Company,
Oxford, Ohio.

More Trade Names

I suggest that you expand the "Trade Name Section" of the Buyer's Guidebook Number. It gets better each year.

A. H. DURIEUX,
Aridye Corporation,
Fairlawn, N. J.

Editorial Note: Each year the editors of the Buyer's Guidebook Number add to the list all pertinent trade names published in the monthly Trademark Section of CHEMICAL INDUSTRIES and also cull the literature for other trade names that may not be actually registered.

You Must Have At Least One Question

A good friend of "We" reported that A. V. Wilker of National Carbon and F. J. Curtis of Monsanto recently did an exceptionally fine job of telling the Charleston Chemical Engineers Association "What Industry Expects of the Chemical Engineer." We asked Mr. Curtis, when he dropped in for a visit with us in New York, if he would prepare an article on this subject for the readers of "C. I." He reported that in his opinion the question and answer period which followed the prepared speeches was the most interesting part of the meeting and also made what we think is an excellent as well as an unusual suggestion—"Why not let the readers of *Chemical Industries* submit questions in advance?"

So consider this a cordial invitation to send in any questions that come to mind. With a representative set of questions we know that Mr. Curtis will give us a hum-dinger of an article, straight from the shoulder and with no punches pulled. Simply address your questions to the Editor, Chemical Industries, 522 5th ave., N. Y. City.

CALENDAR OF EVENTS

August

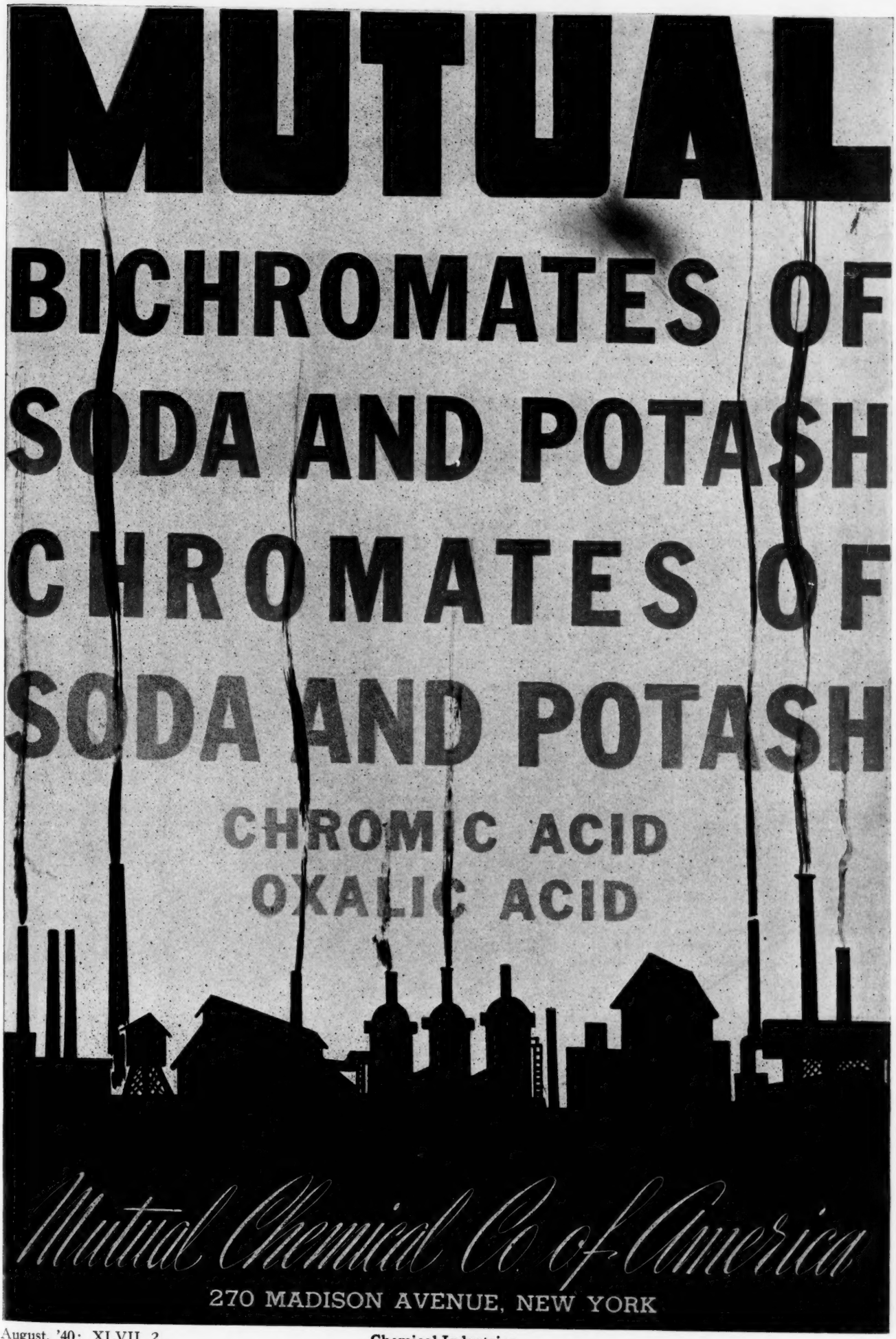
Aug. 14, New Orleans Paint, Varnish & Lacquer Ass'n., New Orleans Athletic Club, New Orleans, La.
Aug. 20, Salesmen's Association of the American Chemical Industry Golf Tournament, Bonnie Briar Club, Larchmont, N. Y.
Aug. 20-23, Technical Association of the Pulp and Paper Industry, Fall Meeting, Seattle, Wash.
Aug. 29, Chicago Drug & Chemical Association, Monthly Luncheon, Morrison Hotel, Chicago.

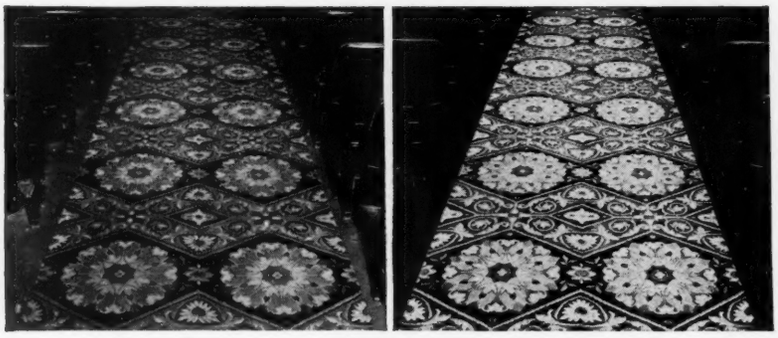
September

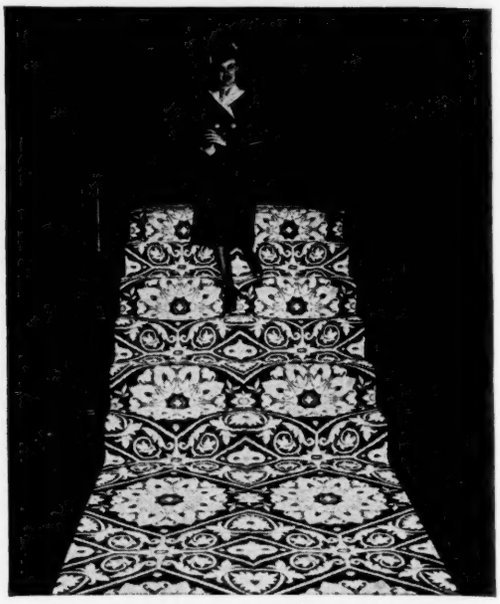
Sept. 2, Chicago Paint & Varnish Production Club, Electric Club, Civic Opera Building, Chicago.
Sept. 3-5, American Society of Mechanical Engineers, Fall Meeting, Spokane, Wash.
Sept. 4-6, Pennsylvania Electric Association, Bedford Springs Hotel, Bedford Springs, Va.
Sept. 5, Indianapolis Paint, Varnish & Lacquer Ass'n., Columbia Building, Indianapolis, Ind.
Sept. 6, Baltimore Paint & Varnish Production Club, Baltimore, Md.
Sept. 8-11, Federal Wholesale Druggists Ass'n., Hot Springs, Va.
Sept. 9-12, American Chemical Society, 100th Fall Meeting, Detroit, Mich.
Sept. 9-12, Illuminating Engineering Society, Essex and Sussex Hotel, Spring Lake, N. J.
Sept. 10, Louisville Paint, Varnish & Lacquer Ass'n., Louisville, Ky.
Sept. 11, New Orleans Paint, Varnish & Lacquer Ass'n., New Orleans Athletic Club, New Orleans, La.
Sept. 17, Salesmen's Association of the American Chemical Industry Golf Tournament, Pomonok Country Club, Flushing, N. Y.
Sept. 18, National Industrial Advertisers' Association, National Conference of Industrial Advertising and Marketing Executives, Detroit, Mich.
Sept. 18-20, National Petroleum Association, Hotel Traymore, Atlantic City, N. J.
Sept. 23-27, The National Ass'n. of Retail Druggists, Hotel Pennsylvania, New York, N. Y.
Sept. 26, Chicago Drug & Chemical Ass'n., Monthly Noonday Luncheon, Morrison Hotel, Chicago.
Sept. 30-Oct. 3, National Wholesale Druggists Ass'n., Annual Convention, Greenbrier Hotel, White Sulphur Springs, W. Va.

October

Oct. 2-5, Electrochemical Society, Inc., Semi-Annual Convention, Ottawa, Ont., Canada.
Oct. 3, Indianapolis Paint, Varnish & Lacquer Ass'n., Columbia Club, Indianapolis, Ind.
Oct. 4, Baltimore Paint & Varnish Production Club, Baltimore, Md.
Oct. 7, Chicago Paint & Varnish Production Club, Electric Club, Civic Opera Building, Chicago.
Oct. 7-11, 29th National Safety Congress and Exposition of the National Safety Council, Stevens Hotel, Chicago.
Oct. 8, Louisville Paint, Varnish & Lacquer Ass'n., Louisville, Ky.
Oct. 9, New Orleans Paint, Varnish & Lacquer Ass'n., New Orleans Athletic Club, New Orleans, La.
Oct. 9, Philadelphia Paint, Varnish & Lacquer Ass'n., Philadelphia, Pa.
Oct. 18-20, Drug, Chemical and Allied Sections, N. Y. Board of Trade, Fall Meeting, Skytop Lodge, Skytop, Pa.


MUTUAL
BICHROMATES OF
SODA AND POTASH
CHROMATES OF
SODA AND POTASH
CHROMIC ACID
OXALIC ACID
Mutual Chemical Co. of America
270 MADISON AVENUE, NEW YORK





(*Above*) **MAGIC CARPETS** now glow in the dark to guide theater-goers safely to their seats when the house lights are off. Secret of the carpet's magic lies in the combination of special fluorescent dyes and invisible rays of ultra-violet light. This application of dyes, which glow only under ultra-violet, was developed by Calco Chemical Division of American Cyanamid—represents one of Calco's many contributions in the field of new and better dyes. Photo at left shows the appearance of a carpet colored with the fluorescent dyes, and exposed to the rays of ordinary light. Center photo shows the same carpet under the ultra-violet rays. At right, it may be seen how effectively the carpet lights up a stairway—yet its soft glow does not interfere with the vision of those already seated in a theater.

(*Above*) **FIRST ACRYLONITRILE** to be produced commercially in this country is AERO* BRAND, developed by Cyanamid. AERO BRAND ACRYLONITRILE opens up new possibilities for the production, from domestic materials, of synthetic rubbers having a high degree of resistance to greases, gasoline, light, heat, and abrasion. AERO BRAND ACRYLONITRILE is stable on long storage, is non-corrosive, can be shipped safely in steel drums without deteriorating, has the high degree of purity essential in producing synthetic rubbers of this type. Commercial production of acrylonitrile represents another step in Cyanamid's program of constantly developing new chemicals for industry.

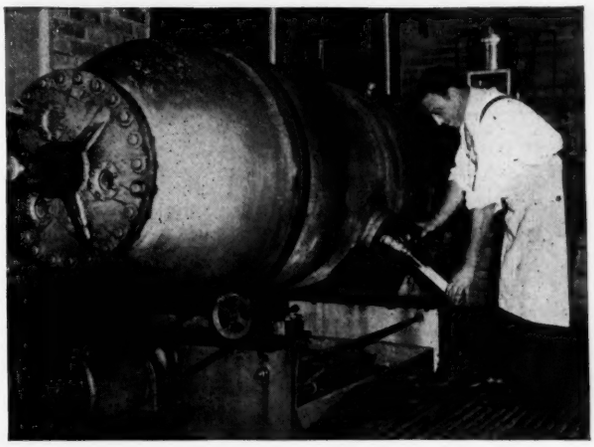
LIFE on the Chemical Newsfront

(*Left*) **CYANAMID'S SERVICE** to the paper industry has been expanded by the acquisition of the business relating to the manufacture and distribution of the line of wax-rosin size, all wax size, and liquid rosin size formerly made by Bennett, Inc. These products will supplement Cyanamid's present line of sizing materials for the paper, paper board, and related industries. The technical service offered to the paper industry in the past by both Cyanamid and Bennett will be continued, and will be supported by the research facilities of the Stamford Laboratories. This new step in Cyanamid's program will result in offering even more effective service to the manufacturers of paper and paper board.

(*Above*) **CHEMISTRY PLAYS ITS PART** at Goshen, N. Y., where the Hambletonian, annual classic among horseracing events, will be held this year on August 14. Outstanding application of chemistry is in the making of the harness (right), which, for events like this, must be prepared with extreme care. The leather for the harness, for example, must be properly tanned. For meeting exacting requirements in the leather industry, Cyanamid's full line of leather chemicals is an important factor. Cyanamid's TANAK* is so free from impurities that it permits the tanner to make leather with an exceptionally clear and uniform shade, yet it is relatively low in price. Moreover, the use of TANAK allows a reduction in the amount of sulphuric acid customarily introduced into the leather, with a resulting increase in tensile strength and service life of the leather. Other Cyanamid leather chemicals include unhairing compounds, bating agents, and wetting agents.

(*Above*) **CHEMICAL LABORATORIES** have become a popular background for movie productions, as Hollywood keeps pace with the growing importance of chemical research. Scene illustrated is from M-G-M's "Edison, The Man," with Spencer Tracy in the role of the inventor.

(*Above*) **NEW SAFETY STANDARDS** are being set in many industries once regarded as hazardous. Development of new types of protective clothing has helped industry to make substantial reductions in accident rates. Typical of the protective garments available are those displayed at the recent Midwest Safety Conference. Left to right, photo shows: an asbestos jumper with sewed-in feet and gloves, designed for fighting oil well fires; a cactus cloth jumper to be worn in match factories; three-piece wool garment for steel mills; and a jumper suit with steel-studded gloves, leather spats, and pressed fibre hat, for protecting foundry workers.



(*Above*) **CHEMURGY RECLAIMS WASTES** for an ever broadening range of industrial applications. At the Agricultural By-Products Laboratory of the Department of Agriculture at Ames, Ia., chemists have completed laboratory studies on the use of corn sugar as one of the raw materials for the production of calcium gluconate, calcium lactate, and other compounds for medicinals—are now adapting the results on a pilot plant scale. The corn sugar is fermented by molds in the presence of calcium carbonate. Photo shows sample being drawn from an aluminum drum to check fermentation progress in studying operation of the pilot plant.

American Cyanamid & Chemical Corporation

30 ROCKEFELLER PLAZA • NEW YORK, N. Y.

*Registered U. S. Patent Office

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CAUSTIC SODA
CARBONATE OF POTASH
CAUSTIC POTASH

CHEMICAL INDUSTRIES
The Chemical Business Magazine
Established 1914

Conscription and Chemical Production

MOUNTING opposition to compulsory selective service appears to be more directed to specific provisions of the proposed Burke-Wadsworth Bill than to the basic idea of conscription of man-power. Certainly there are a number of proposals in the measure that are open to justifiable criticism and these could and should be ironed out speedily by the Senate and House Committees and, if necessary, by Congress itself without lengthy debate.

It must be plain to every thinking person in the light of what has and is happening in Europe that man-power alone is of very little value in fighting either a defensive or an offensive war. Essential industries must be geared to a terrifically high pitch of productive capacity supplying the thousands of items that are vitally necessary. This means that from a very practical and irrefutable point of view we cannot depend upon haphazard volunteer recruiting that will unquestionably cause key men to be drawn away from industry, men who are indispensable to successful prosecution of the preparedness program.

Chemical Industries in June pointed out editorially that, although American chemical industry is at its highest peak of efficiency, any withdrawal of chemists and key foremen vitally needed in research and manufacturing operations would prove disastrous. The editors of this paper recently called this editorial to the attention of Representative James W. Wadsworth, co-author of the proposed conscription bill, and are delighted to publish his reply.

"You mention the importance of exempting from the provisions of the proposed universal military service bill chemists and key foremen in chemical plants. Proponents of this bill, after extensive hearings before the Senate and House Military Affairs Committees, have reached the decision that it would be unwise to name, specifically, occupations or professions whose members should be exempt from the draft. It is better, we believe, to rely upon broader language which will make the intent of the Congress perfectly plain and yet not single out for especial consideration any profession or occupation. The language in the bill now agreed upon reads as follows: 'The President is authorized, under such regulations as he may subscribe, to defer training and service in the land and naval forces of the United States of those men whose employment in industry, agriculture or other occupations or employment is found to be necessary to the maintenance of the national health, safety or interest.' The local draft boards would be guided by such a provision, and I am sure could be trusted to administer it wisely in each particular case. Obviously, chemists engaged upon work of real value to the national health or interest and key foremen in chemical plants would, in all probability, be exempt."

We can see no possible quarrel with this position. The mere possession of a chemical degree should not provide exemption. Similarly, the lack of a formal degree in chemistry or chemical engineering should be no bar to exemption for thousands of key foremen and others who must be held to their posts in industry to prevent chaos occurring in chemical manufacturing operations.

There is no valid objection to conscription because at the moment we are not actually in a state of war. The formality of declaring war no longer is followed, at least by the totalitarian states. If we as a nation are agreed that we are in possibly grave danger of attack from aggressor nations, then it behooves us to move with expediency along the path toward intelligent preparation, unhampered by antiquated notions that America can successfully be defended by the Bryan formula of a million men springing to arms overnight.

ACHIEVEMENTS

Striking vats in plant of Reichhold Chemicals, Inc.

Desire to Relieve the Drabness of Human Surroundings Through Use of Crude Dyes Can Be Traced Back to the Dawn of History. Ancient Colors Were Derived From Herbs, Berries, Minerals, and Even the Blood of Shellfish. William Henry Perkin, in 1870, Stumbled Upon the First Synthetic Formula in a London Experiment. This Article Which Traces the Dye Industry From Its Earliest Stage Through the Myriad Modern Developments Amounts, Virtually, to a Reference Work.

COLOR is as old as the earth. A world without color would be inconceivable. As long as there have been living creatures with eyes to see with, they have watched the beauty of the foliage and the flowers, the green of the trees and pastures, the blue of the sky and sea, and the many colors of the rocks and sands of the soil.

As far back as history records, man has used colors for his pleasure and joy. In the book of Genesis, Jacob's "coat of many colors" is referred to as a much prized gift from his father. Colors were used prior to the use of written records. Mummies, estimated to have been entombed as early as 4000 B. C., have been found wrapped in fabrics dyed with indigo. In ancient days all of the coloring materials were derived from herbs, plant stems, seeds or berries, the blood of shell fish, insects, and minerals.

Nearly all of the ancient colors derived from these many sources have been replaced by synthetic materials, although the earth colors are still commonly used for a variety of purposes. Natural dyes were extensively used until the latter part of the nineteenth century. Until then, the indigo derived from indican, a constituent of the indigo plant, alizarine from the root of the madder shrub, cochineal from certain tropical insects, and logwood from Central American trees were the principal natural dyestuffs and were supplied in large quantities.

It was not until about 1870 that the present synthetic dyestuff industry had its beginning, and since that time, it has progressed by leaps and bounds, and today is one of the large chemical industries. The story of William Henry Perkin, who discovered mauve, the first of the synthetic aniline dyes, is outstanding in historical chemical discoveries. Perkin, while attending the City of London School at the age of thirteen, heard that an extra course of lectures was to be given by a German chemist, Hoffman, during the noon recess, and he skipped his lunch in order to hear them. Hoffman had opened a laboratory at the Royal College of London, and Perkin, whose imagination had been fired with these chemistry lectures and the possibilities of research, applied for admission and was accepted. He spent two years attempting to isolate phenanthrene from coal tar as a starting point for the preparation of artificial quinine. Had he been successful, he would probably have never discovered the aniline dyes; but while oxidizing some aniline oil, he obtained a black, tarry mass instead of the white crystals which he had expected, and in washing this tarry mass with alcohol, he obtained a beautiful purple solution. This was "mauve" the first of the aniline dyes.

Some ten years later he rivaled nature again by producing alizarine, the coloring matter of the madder root. While alizarine had been isolated some forty years previously, it was not until 1868 that Perkin discovered that its base was anthracene, a coal tar product. Then

IN COLORS

A Collaboration

By

Gustavus J. Esselen, Inc.

Arthur D. Little, Inc.

Skinner & Sherman, Inc.

came a race between Perkin and his German rivals to discover a cheap process for making alizarine from anthracene, but the German chemists beat him to the patent office by one day.

One of the most striking achievements of synthetic dyestuffs is the making of indigo, one of the oldest and fastest of the natural dyestuffs. In 1897, nearly a million acres in India were growing the indigo plant, and the annual value of the crop was $20,000,000. A profitable process for making indigo was worked out by a German chemist named Baeyer, after fifteen years of research and at an expense of $5,000,000, so that in 1914 only $300,000 worth was produced in India. The German dye concerns had a monopoly on the manufacture of indigo, making 96 per cent. of the world's production. A hundred years ago, indigo cost four dollars per pound. Today it is in the neighborhood of 15 cents per pound and of much better and more uniform quality. At the beginning of the twentieth century, Germany was paying more than $3,000,000 a year for indigo. Fourteen years later they were selling $12,000,000 worth.

Synthetic dyes are commonly known as coal tar dyes, but this term gives a somewhat erroneous impression. It is true that crude coal tar, obtained in the destructive distillation of coal, is the original source from which the dyes are made. It is necessary to first distill the tar to obtain the "crudes", which are the chemical bases for the more complex "intermediates", which must themselves be further elaborated to furnish an almost infinite variety of useful compounds.

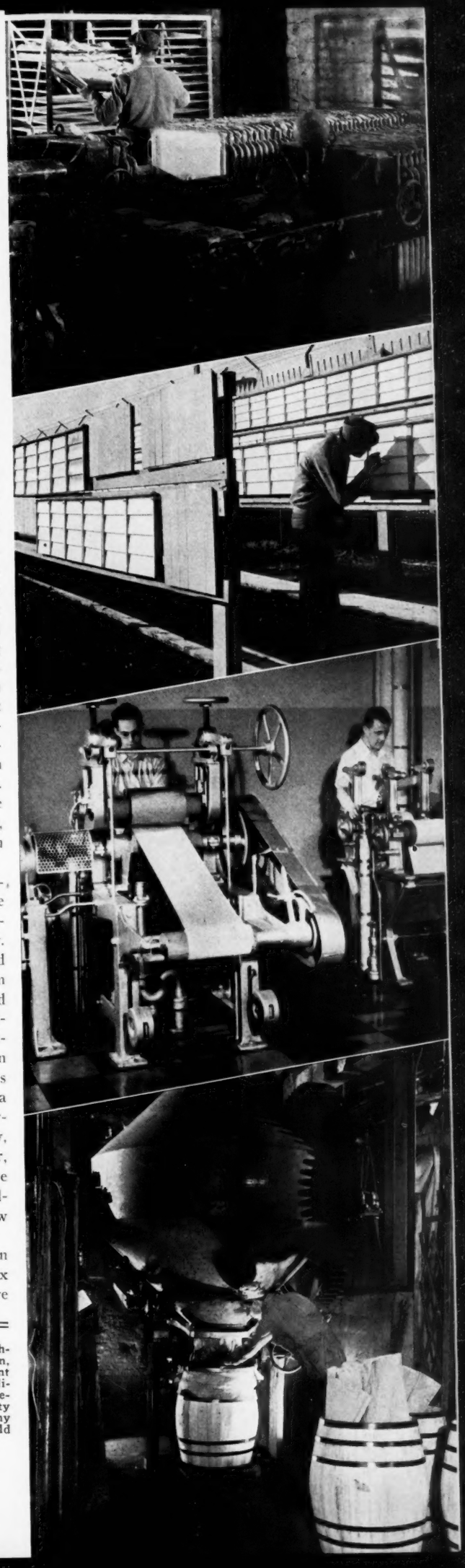
The "crudes" obtained from coal tar are benzol, toluol, xylol, phenol, cresol, naphthalene, anthracene, methyl anthracene, phenanthrene, and carbazol. None of these resembles coal tar in any way. They are colorless liquids or white solids with distinctive odors, which has resulted in classifying them as aromatic compounds, an important class of organic chemicals.

The variety of products derived from coal tar would never have been produced had it not been possible for the chemist to visualize the structure of the benzol molecule. It had been known that benzol contained 6 carbon atoms and 6 hydrogen atoms, but this composition did not make chemical sense as each carbon atom was known to have 4 bonds or points of attachment, while hydrogen had only one.

The German chemist, Kekule, was particularly intrigued by this puzzle and spent much time thinking about it. One day, in a semi-dream, he saw a hexagonal chain of six carbon atoms with joined hands forming a ring, while the six hydrogen atoms were holding onto the outside hands. He tested his theory and found that it was sound. The structure of the simplest of the coal tar compounds, benzene, as demonstrated by the Kekule or "benzene" ring, has enabled the chemist to picture how other atoms and molecules can be added to the benzene ring to form additive and replacement compounds of complex composition, and with varying properties. Some of these are most complicated, such as sodium-ditolyl-diazo-beta-naphthylamine-6-sulfonic-beta-naphthylamine-3.6-disulfonate, better known under the trade name of Brilliant Congo. Without being able to picture possible combinations of the original benzene ring, such compounds would never have been made.

Although coal tar colors were first discovered in England, the Germans were the first to take advantage of the possibilities of a sizeable dyestuff industry. England had given Perkin a title but did not give him the support necessary in developing an industry which required adequate facilities for research and development. Germany, on the other hand, provided liberal funds and concentrated on research, with the result that new colors were produced one after another in a long procession. This resulted in a German monopoly of the dyestuff industry, and at the outbreak of the World War, the Germans were manufacturing more than 75 per cent. of all coal tar products of the world, and supplying raw materials for much of the remainder.

England was in a predicament when the War broke out. There were only six dyestuffs factories employing thirty-five



Top to bottom—Pigment extractors at Reichhold; Test fences of N. J. Zinc at Palmerton, Pa., where zinc oxides mixed into paint formulas are tested under all weather conditions; Making semi-practical trials of dyestuffs in order to determine their suitability for use in textile industry, in Ciba Company laboratories; Pigment blenders in Reichhold plant.

chemists, while one German color company alone, the Hochster Farbwerke, employed three hundred and seven chemists and seventy-four technologists. Meanwhile the price of dyes soared. A blue cotton dyestuff, which sold before the War for sixty cents a pound, went to thirty-four dollars, a pink rhodamine formerly priced at a dollar pound soared to forty-eight dollars, and a keg of dye which had cost fifteen dollars was sold at auction for $1,500. Colors were lacking for uniforms and flags for the armed forces and, of course, the civilian population could get almost nothing. This emergency, however, was valuable to British and American companies. It spurred them to titanic efforts, and today, both countries are independent of Germany. We now produce about 95 per cent. of the dyes we use and could make the other 5 per cent. if it became necessary or desirable. Of course, the seizure of 4,500 German chemical patents by the Alien Property Custodian and the subsequent assistance of the Chemical Foundation made this result possible in a fraction of the time that might otherwise have been required.

Some idea of how dependent we were in 1914 for German dyes can be seen from the following. In 1914, according to reports of the U. S. Tariff Commission there were but seven dye producers who turned out 6,619,729 pounds, with but a value of $3,470,096. According to the same authority output in 1939 amounted to 120,190,000 pounds, with a value of $70,223,000.

It should be appreciated that the chemistry of dyestuffs today has little resemblance to the semi-accidental developments of the discovery days. Nor does it take years of research to perfect a new dye. There are more than 1,500 known coal tar colors, but research continues for the reason that certain desirable qualities have not been obtained in all groups of dyes. Also, new fibers have been produced, and these have required new types of dyes and of dyeing. This is particularly true when a number of fibers of different kinds are woven together and colors of selective action must be used. Also we must remember that dyes for acetate rayon and plastics have become very important in our industrial life, and a very considerable amount of research has been devoted to development of special dyes for a wide variety of applications not even thought of a decade or two ago.

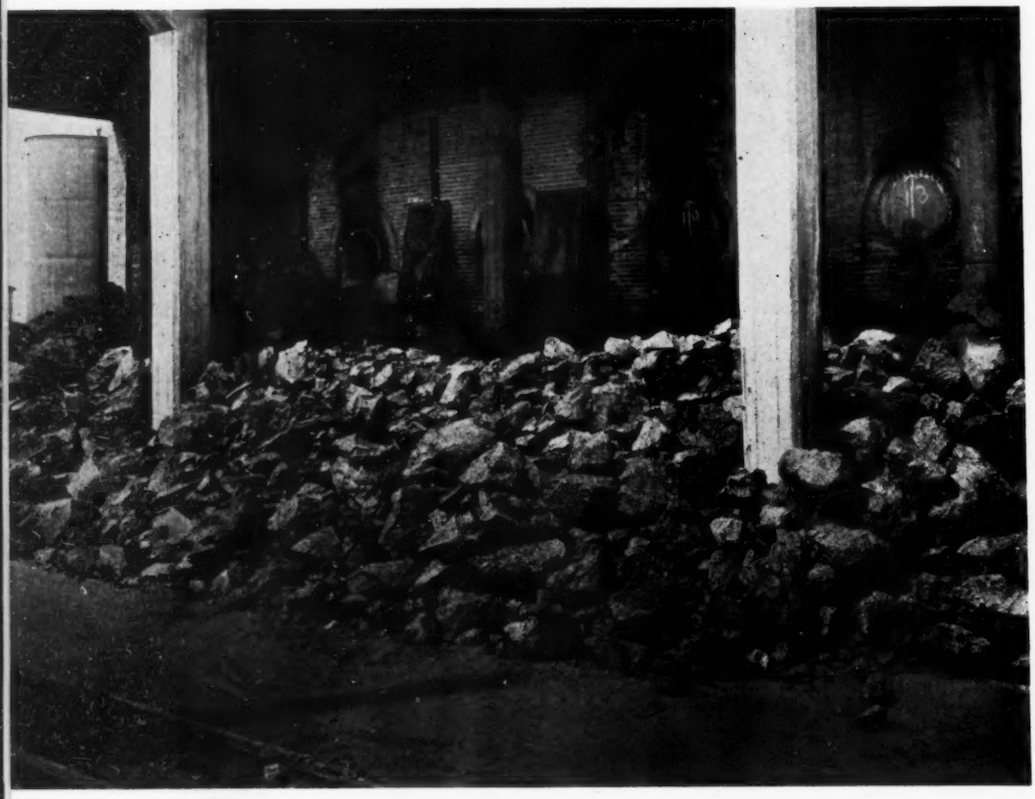
The dye chemist of today has a good understanding of the internal mechanism of dye molecules. It is not necessary for him to try this, that, and the other thing, in the blind hope that he will hit upon the desired result. Rather does he approach the problem of securing the shade, degree of fastness to light or washing, and affinity for certain fibers, with a knowledge of the most likely modifications of the molecules which should be accomplished.

The aniline or coal tar colors may be classified in a variety of ways, but from the standpoint of practical application it is customary to group them in accordance with their general properties, rather than by chemical composition. There are five such groups, namely basic, acid, direct (or substantive) dyestuffs, sulfur colors, and vat dyes. Each group has distinctive chemical and physical properties relative to their action and in their method of application.

The basic dyes have a similarity in their chemical behavior to such inorganic bases as caustic soda. They appear on the market as salts of the color bases and must be treated with an acid to form soluble salts. They are used for the dyeing of cotton, silk, and paper, and require a mordant of an acid character, such as tannic or acetic acid. They are characterized by extreme brightness and great tinctorial power, but as a class they possess poor fastness to light. They are sensitive to hard water or any free alkali which sets free the insoluble dye base and causes uneven or spotty dyeing.

The acid dyes appear on the market as salts of the color acids and are so named because in the salt the dye radical takes the place of the acid constituent, and gives a molecular formula such as sodium (dye acid), whereas with the basic dyes, the dye radical takes the place of the base in which the molecular formula would be dye base (oxalate). As a class, the acid dyes have a lower coloring power than the basic dyes, but are much faster to light and give more even dyeings. They have no direct affinity for cellulose fibers and require a mordant which fixes the dye to the fiber.

Tremendous development of U. S. coal tar industry has made possible large scale production of synthetic dyes. Photo shows discharge of pitch coke from still in tar distillation operations at Reilly Tar & Chemical Plant.



Differentiation Between Types

The direct or substantive dyes are also salts of the color acid, but are differentiated from the acid dyestuffs by the fact that they do not require a mordant. These dyestuffs are so named because of their affinity for cellulose fibers. They have less tinctorial power than the acid or basic colors, but in most cases are faster to light.

The sulfur colors derive their name from the fact that sulfur has a predominant part in their manufacture. They are insoluble in water, but are soluble in alkaline sodium sulfide in which the dyestuff is reduced. This reduced form adheres to the cellulose fiber and is oxidized to the desired color by exposure to the air. The only asset of sulfur dyestuffs is their cheapness.

Vat colors are pigments that are prepared by special processes from the aniline dyestuffs themselves. These pigments are, for the most part, fast to light colors. The indanthrene colors are a special form of the insoluble dyestuffs of that name and are the fastest colors known.

The value of aniline colors lies in their almost infinite variety. Dyes can be

made that will attach themselves to cotton, wool, or silk, paper fibers, and leather; in fact, almost any product of vegetable or animal origin. They will give almost any shade, some of which are fast and will withstand wear as long as the fabric will last. It may seem to the reader that little remains to be done in the development and application of dyestuffs, but research will continue as long as there is a dye industry. We must perfect our understanding of molecular structure and the causes of color. We must have cheaper and more efficient processes to utilize products now wasted, and we must try to get a better understanding of the processes used by nature in converting carbon dioxide into the complex coloring matters of plants and flowers.

One of the most outstanding developments of the past decade has been the introduction of the Monastral blues. It is an insoluble pigment dyestuff possessing a most beautiful shade of blue. From a reddish blue in strong shades, it merges through varying shades of blue to a brilliant greenish blue in pale (pastel) shades. It has amazing properties in that it appears to combine in itself all the most desirable properties of the ideal blue pigment dyestuff, and so is suitable for practically all pigment dyestuff-consuming industries. Because of its all-round general fastness, texture and working properties, this comparatively new blue is the nearest to the ideal blue pigment yet produced.

Has Many Applications

As a pigment it is of particular interest to manufacturers of oil paints and enamels and cellulose lacquers, printing inks water paints, molding powders, soaps, sealing waxes, artists' colors, wall and coated papers, leather and book cloths, linoleums, etc.

A companion product, a Monastral green, a very bright green with all the properties of high fastness associated with its now well-known parent, has made a dramatic appearance.

Two recent introductions of first importance are the procedure of dyeing by development of the color of the fabric and the Aridye colors employed in increasing quantities for printing textiles.

Aridye textile printing colors are said to have a number of very important advantages over the water-soluble dyes including the following: 1. They print more sharply; 2. Maintain uniformity of shade; 3. Produce finer tone gradations; 4. Reproduce engravings exactly; 5. Are fast to washing and exceptionally fast to sunlight; 6. Need no chemical after treatment to develop the colors. Time is also saved in matching.

Aridye colors have been used mainly on cotton but they are also suitable for pigmented, filament and spun rayons of the viscose and cupra-ammonium type. Satisfactory fastness is not obtained on wool. Limited testing has shown good results on silk. Acetate prints are not generally satisfactory.

United States Production and Sales of Synthetic Organic Dyes*

	1925-1930 Average	1938	1939	Increase 1939 over 1938, per cent.
Production, lbs.	94,003,000	81,759,000	120,190,000	47.0
Sales, lbs.	92,207,000	87,803,000	114,494,000	30.4
Sales, Value, dollars	30,428,000	53,096,000	70,223,000	32.3

* U. S. Tariff Commission.

United States Production of Dyes by Classes of Application*

Class of application	Quantity, Thousands of Lbs.			Per cent. of Total		
	1925-1930 Average	1938	1939	1925-1930 Average	1938	1939
Acetate silk	(1)	2,072	2,585	...	2.5	2.2
Acid	11,814	11,699	17,700	12.6	14.3	14.7
Azoic	(1)	2,688	3,318	...	3.3	2.8
Basic	4,833	4,473	6,415	5.1	5.5	5.3
Direct	17,984	21,061	31,438	19.1	25.8	26.2
Lake and spirit-soluble	1,947	2,285	3,305	2.1	2.8	2.7
Mordant and chrome	3,612	3,059	5,237	3.8	3.7	4.4
Sulfur	20,005	11,460	18,651	21.3	14.0	15.5
Vat, total	33,221	22,346	30,035	...	...	...
(a) Indigo	27,128	11,001	12,475	28.9	13.5	10.4
(b) Other	6,093	11,345	17,560	6.5	13.9	14.6
Unclassified	587	616	1,506	.6	.7	1.2
Total	94,003	81,759	120,190	100.0	100.0	100.0

(1) Not shown separately during 1925-1930.
* U. S. Tariff Commission.

United States Sales of Dyes by Classes of Application*

Class of application	Quantity, Thousands of Lbs.			Per cent. of Total		
	1925-1930 Average	1938	1939	1925-1930 Average	1938	1939
Acetate silk	(1)	2,030	2,402	...	2.3	2.1
Acid	11,700	12,416	17,063	12.7	14.1	14.9
Azoic	(1)	2,591	3,145	...	3.0	2.7
Basic	4,710	4,418	5,976	5.1	5.0	5.2
Direct	17,581	21,967	30,421	19.1	25.0	26.6
Lake and spirit-soluble	1,897	2,339	3,278	2.1	2.7	2.9
Mordant and chrome	3,559	3,452	5,325	3.8	3.9	4.7
Sulfur	19,810	12,856	17,311	21.5	14.7	15.1
Vat, total	32,429	25,031	28,135	...	...	...
(a) Indigo	27,112	11,738	11,949	29.4	13.4	10.4
(b) Other	5,317	13,293	16,186	5.8	15.1	14.1
Unclassified	521	703	1,438	.5	.8	1.3
Total	92,207	87,803	114,494	100.0	100.0	100.0

(1) Not shown separately during 1925-1930.
* U. S. Tariff Commission.

United States Sales Value of Dyes by Classes of Application*

Class of application	Value, Thousands of Dollars			Per cent. of Total		
	1925-1930 Average	1938	1939	1925-1930 Average	1938	1939
Acetate silk	(1)	$2,002	$2,211	...	3.8	3.2
Acid	$8,652	9,842	13,296	21.9	18.5	18.9
Azoic	(1)	4,151	5,593	...	7.8	6.7
Basic	3,977	4,152	4,708	10.1	7.8	8.0
Direct	9,077	11,969	16,649	23.0	22.5	23.7
Lake and spirit-soluble	1,682	1,767	2,298	4.3	3.3	3.3
Mordant and chrome	2,212	1,728	2,665	5.6	3.3	3.8
Sulfur	3,929	3,216	4,657	10.0	6.1	6.6
Vat, total	9,115	13,578	16,789	...	...	...
(a) Indigo	3,741	1,850	1,843	9.5	3.5	2.6
(b) Other	5,374	11,728	14,946	13.6	22.1	21.3
Unclassified	784	691	1,358	2.0	1.3	1.9
Total	39,428	53,096	70,224	100.0	100.0	100.0

(1) Not shown separately during 1925-1930.
* U. S. Tariff Commission.

Pigments, like dyes, were used in prehistoric days. There is evidence of paint compounds used for the decoration of tombs of the early Egyptians, as far back as 2500 B. C. The Greeks and Assyrians were also prone to the use of

decorative colors, and the ruins of Pompeii and Herculaneum show that the structures of those days were liberally colored. All of the colors used in those days for the adornment of buildings were natural earth colors.

A variety of earth pigments are still used in large quantities in the preparation of paints, for the coloring of paper, and a host of other materials. We have the ochres, which are natural silicates containing oxides of iron. They range from yellow to brown depending on the degree of hydration of the iron oxide. The siennas are also natural silicates containing manganese, and the range of shades is much the same as the ochres. The umbers are complex silicates containing a high percentage of manganese oxide and ferric hydrate. In their natural state they are greenish brown, but on burning become a deep rich brown.

The iron oxides, either natural or manufactured, range from black to red. Iron also gives us the ferrocyanide colors, such as Prussian blue, made by the precipitation of ferric sulfate and potassium ferrocyanide.

Lead, either as the oxides or the chromates, furnishes colors from bright yellow to orange. Chromium is the basis of our green pigments, and the soot produced by the incomplete combustion of oily and organic compounds supplies our black pigments.

The principal inorganic colors are as follows: Chrome yellow, available in a wide variety of shades, from the very pale canary or primrose to a comparatively deep red, which is known as C. P. deep chrome orange. The intermediate shades are often referred to as lemon, medium, etc.

Structure of Lighter Shades

The lighter shades are combinations of lead chromate with a precipitated lead sulfate or other insoluble lead salts. The best quality medium yellow is a commercially pure lead chromate, above 98 per cent. lead chromate. The more red shades (chrome oranges) are basic lead chromates. It is said that the lemon shades of chrome yellow have the highest oil absorption, and the deepest shade of chrome orange the lowest. Chrome yellows do not fade when exposed to sunlight, but they do darken in time and the cause or causes are not definitely known.

Zinc yellow is a color the composition of which is not exactly known. It is generally referred to as zinc chromate. Some authorities claim it is a complex salt of zinc and potassium chromate. It has less tendency to darken on exposure than a primrose chrome yellow, but does show a tendency to bleed in water. This characteristic, however, does make it useful as an excellent rust inhibitive pigment.

The cadmium yellows are combinations of cadmium sulfide, barium sulfate, with or without zinc compounds, and are produced in shades running from a C. P. primrose yellow to a C. P. light chrome orange. They have good resistance to light exposure. In time they tend to oxidize to cadmium sulfate. Their relative high price make them adaptable largely for special uses. They are not affected by hydrogen sulfide, are nonbleeding in oil and lacquer solvents, are resistant to alkalies but not to acids.

Cadmium reds are produced by combining selenium with cadmium sulfide. Some shades are much deeper than C. P. deep para toner. They are higher in cost than the cadmium yellows.

The iron blues carry a number of designated names, such as Prussian, Chinese, Melori, bronze, steel, etc. These names over the past several years have lost a great deal of their meaning insofar as such names designate specific physical characteristics. The iron blues are made by precipitating ferrous salts with sodium or potassium ferrocyanide, usually the former because of the cost situation.

Very important are the chrome greens, combinations of chrome yellow and iron blue in varying proportions. They possess very excellent hiding power and in house paints, for example, large proportions of extenders, such as barytes and clay can be employed. Alkaline extenders, however, should not be used. In recent years considerable advances have been made in lowering the degree of darkening of the chrome greens.

Most Stable Green Pigment

The most stable green pigment is chromium oxide (Cr_2O_3). It is absolutely fast to alkali of any strength, is unaffected by the strongest mineral acids or hydrogen sulfide, and resists extremely high temperatures. It does lack brilliance, however, and has a relatively low tinting strength. Hydrated chromium oxide (guignet green) containing water of crystallization is very brilliant in shade though rather transparent.

Most green toners are now being produced from dyestuffs, for example, malachite green, precipitated with tungstic or molybdic acid. Colors thus produced are much more brilliant than chrome green although they lack the latter's permanency. They are employed in large quantities in the formulation of interior enamels.

Lapis lazuli, or natural ultramarine blue, a complex mixture of minerals, has been replaced by artificial ultramarine, a double silicate of sodium and aluminum with some sodium sulfide. This is made by heating a mixture of soda ash, clay, charcoal and sulfur. By varying the mixture and by modification of the process, not only the blue pigment is obtained, but red, green, and violet ultramarines may also be produced.

These pigment colors are as a rule low in tinctorial power, but are valuable for purposes where permanence is desired and where dyes cannot be used to advantage, such as in paints, rubber, plastics, and many other industries.

Mention should also be made of the white pigments, such as white lead, clay, zinc oxide, titanium oxide, and lithopone. Titanium oxide has come into quite general use where extreme whiteness is desired, its whiteness being far greater than that of any other white pigment. Lithopone is a purely synthetic pigment consisting of barium sulfate, zinc sulfide, and zinc oxide, and is used extensively in the manufacture of paints, in rubber, linoleum, and white printing ink.

Another class of colors, known as the lakes, are dyes which are precipitated on inert bases such as barytes, aluminum hydroxide, blanc fixe, clay, whiting, etc. Although the color is due to the dye, lakes are considered as belonging to the pigment rather than to the dye group. The dyes are precipitated on these white pigments by means of salts or acids to form an intimate mixture, and while they are more brilliant than other pigments, they are rarely as permanent.

Toners Similar to Lakes

Toners are similar to lakes in that they are precipitates of dyes as salts and contain no inert base like the lakes. The red toners and also the red lakes are the most important of this class as there are practically no bright reds among the mineral or natural pigments.

The wide variety of colors available for decorative purposes has resulted in a world of color. While we think most generally of the use of colors in the dyeing of fabrics and in paints for buildings and other structures, their use in other ways accounts for the sale of millions of dollars worth of color. Packages for marketing all sorts of products must be artificially decorated to increase the desire to purchase. Colored pictures tend to make our black and white reproductions seem insipid. Automobiles are supplied in all colors of the rainbow. Even our electric signs draw added attention by their variegated hues. The women of today consume large quantities of color in lipstick, rouge and fingernail enamels.

The psychological value of color available for application to every kind of article of our daily use is essential to modern existence. It brightens our outlook and stimulates our thoughts and emotions and makes life a far more cheerful pleasure than if we were dependent on the sombre color of undyed products or the limited variety of the comparatively small number and limited usefulness of nature's dyes.

Personalities in Chemistry

By Adam C. Fadyen

ANY treatise on the development of chemical technology should contain at least one chapter on the work of Gaston F. DuBois, a man who has been in intimate contact with this science since the turn of the present century. A pioneer who split complex molecules instead of rails, DuBois is best known for introducing to this country profitable methods of manufacturing coal tar derivatives. From a $75 a month chemist he has risen to his present position of Vice-President of Monsanto Chemical Company.

Gaston DuBois was born in Locle, Switzerland, on August 9, 1880, son of Louis Ferdinand and Lucy (Smith) DuBois. After receiving his early education there, he was graduated from the Federal Polytechnic Institute of Zurich in 1903 with a chemical engineering degree. About this time, his abilities as a linguist brought him into contact with an American purchasing agent who hired him as his guide for a business tour of Europe. A close friendship grew up between the two men, and the American, John F. Queeny, dropped the suggestion that his interpreter visit America and get a glimpse of its wonders which were to be displayed at the 1904 World's Fair in St. Louis.

The next year, after studying at the Technische Hochschule in Dresden, Germany, where he specialized in electrochemistry, DuBois embarked for St. Louis to see the Exposition about which he had heard so much. Here he ran into his American friend Queeny, who had recently started up a small saccharin plant which he had named Monsanto Chemical Works in honor of his wife. Offered a job in Queeny's new enterprise, DuBois accepted eagerly.

His first assignment, to install a vanillin plant, was not an easy one and was typical of countless others which were to follow. He had studied something about this subject in Germany and after making his own drawings, found a coppersmith who could read the metric scale and follow his notes, and had the man make the stills and other equipment. In like manner Gaston DuBois successfully developed the first commercial production in this country of one product after another, including caffeine, iron by hydrogen, phenacetin, glycerophosphates, bismuth, and chloral hydrate.

Up to 1914, Monsanto was growing step by step without too many difficulties until all of a sudden the flow of intermediates to this country was cut off by Germany's entrance into the war. DuBois had been advanced to the key post of production manager and proceeded to work day and night to discharge his responsibility of finding out how German scientists had made these intermediates. During this period of chaotic expansion when every success could be measured by a hundred failures, he helped this country gradually discover the secrets of equipment and operating conditions which made possible the synthesis of dyes and drugs.

In 1920, DuBois was made Vice-President of Monsanto in charge of research and development and has held that post until the present date. When the company was reorganized last year, he was appointed a member of the three-man Executive Committee which governs the board operating policies of the company. In 1920 he was made honorary Swiss Consul for the Missouri district and held that post for ten years until the pressure of business forced his resignation.

In the last two decades, DuBois' research activities have been in the fields of insecticides, disinfectants, plasticizers, and rubber chemicals. He has given considerable study to economics in a variety of chemical projects and has delivered a number of papers before the American Institute of Chemical Engineers and the American Chemical Society. To this day he has not lost his enthusiasm for one of the favorite sports of his native land, figure skating.

DuBois is a member of the American Chemical Society, American Electrochemical Society, Deutsche Chemische Gesellschaft, Chemists' Club of New York City, Society of Chemical Industry (London), and a past Director of the American Institute of Chemical Engineers. He is also a member of the National Geographic Society and is on the advisory board of the St. Louis Museum of Natural History. Always interested in civic activities, he served as technical advisor on the recently successful Municipal Smoke Elimination Committee of St. Louis.

He is married and has three children. His eldest son, Rene Gaston, has a position with General Motors Corporation, while Louis Frederic is associated with the Dewey and Almy Corporation. His daughter, Jeanne Marguerite, is at present attending Washington University.

Gaston F. DuBois

INDUSTRIAL RESEARCH

Its Functions and Its Demands

By Walter J. Baeza, *President, Industrial Research Co.*

Last Month These Pages Carried a Discussion of Fundamental Research As It Applies To Industry. Here Is an Expert Diagnosis of the Other Side, With Some Mighty Interesting Thoughts On the Type of Men Who Can Fill the Job.

MILLIONS are spent each year on research in the chemical industry, and there is scarcely any business which does not profit directly or indirectly thereby. From shoes to sealing wax, producers and distributors are research-conscious; are aware of its worth to them and to their customers.

One would think that, with such a full appreciation of the significance of research, there could be no possible chance that its employers would have any doubt of its function and its performance. One would think that no manufacturer would be unable to define exactly the type of research he requires, nor the characteristics and qualifications of the men he needs to solve his problems. One would expect that any man bent on devoting himself to investigations in chemical industry would be aware of the kind of training he should acquire, and know if his be the temperament, personality and attitude, best adapted to the industrial research field.

Exactly the reverse is true. And after a moment's thought the reason for this apparent paradox becomes evident. There are as many types of research as there are human endeavors. The men who seek to determine the age of the earth are researchers; the men who seek to define the qualities of God are researchers; and those who examine into the conformation of the atom are also researchers. So is a sales manager, a traffic router and an explorer.

If these define themselves as geologists, clerics, physicists, salesmen, shipping clerks and travellers, much of the difficulty is avoided. The man who wishes to pursue such activities, can define a course of training to fit himself adequately, within his capacity, for the job. The employer seeking men for these activities, can outline the qualifications which must be met by the man he employs in these endeavors. At the very worst, somewhat elliptical pegs will be plugging round holes.

It is not so easy to avoid misfits in industrial chemical research. We cannot merely re-label the activity and then define the training that is most fitting for it. When industry attempts to do so and picks its men according to some such classification, it too frequently eliminates the best men and selects the poorest. More strangely, when researchers seek opportunities in industry, they frequently stress qualifications which have little or nothing to do with their chances of doing a successful piece of research.

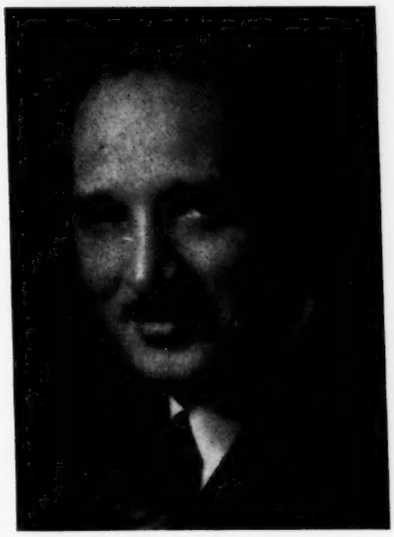
It is undoubtedly too strongly put, to say that the researcher who is successful owes no debt to his training. But it is not too much to say that he owes little to

expert knowledge of a particular specialized field of experience. The research man in chemical industry must have a sound training in chemistry, physics, thermodynamics, mathematics and English or his native tongue. And he must know enough mechanical engineering to know what can be put successfully on a production line, what machines can do, at what cost. If he is in an administrative position, he must be able to read a balance sheet, and be able to project possible profits and losses from an intelligent examination of world resources, supply and demand. His training should equip him for these things.

Let us examine these requirements. The first are the tools of the industry and need no elaboration. But it is surprising how few there are who recognize the importance of knowing how to use a language well. By this is meant no skill in eloquence. Eloquence may be useful to the politician and the trial lawyer; it may even help the researcher get an additional appropriation from his wavering board of directors. It will not advance the solution of a problem in chemical industry a single step. Of course, when the results of two weeks' work in glass crash to the floor via an awkward elbow, its employment is not amiss; though it will not replace even one hour of the two weeks' plugging. But skill in a language is essential for more important reasons. Thinking must be done in words. Thinking is impossible without language. The man who does not command a language, who cannot make it work for him to define his problem in precise terms, does not belong in any kind of creative research. One of the older philosophers has said in effect that if you can phrase the right question you are half way to the solution of your problem.

Industry's Prime Interest

Industry is primarily interested in producing salable products. The industrial research man who evolves a laboratory process which no known machines nor modified machines can employ in the plant has not solved the problem in which he is engaged. But this is not so great a limitation as at first might appear. The number and type of operations which machines perform is so wide, and the accuracy of their performance is so great, that the limitation is one to be kept in mind rather than feared. Machine makers are alert to new developments, and will work hard to modify their standard equipment to meet the demands of the researcher. But the researcher should be sufficiently aware of available machinery to make reasonable demands. Or he should be skilled enough in mechanical engineering to know how to design a machine to perform the operations needed to put his process on the production line. That is why some knowledge of mechanical engineering is part of the basic training required by the industrial research man.



Walter J. Baeza

Industry is interested in profits. It expects to get tangible returns from research. The investigator who ignores this may be a splendid scientist; one whom we may all delight to honor; but he is not a good industrial research man. It is amazing to see some of the results of research in the hands of skilled scientists unequipped to read balance sheets and market reports. Over a period of years, one of our large corporations spent a little less than a million and a quarter dollars to develop a very special product. At length the product was on the market. It was well received by the trade. Then, and only then, it was discovered that the world consumption of the product was less than $25,000 per annum. There was no chance of boosting the market appreciably. There was no chance of capturing the whole market. But suppose this company did capture the whole market. Suppose it made a profit of 50 per cent. net on sales. In one hundred years it would have paid back into the treasury what had been spent on this research. It would still have been out the interest on the investment. The man who directed this research is probably a good scientist, he may even be a good director, he is a mighty bad industrial research man.

Producing From Waste

Then there is the story of the men who worked for many years to make a salable product from an industrial waste. As long as this waste was freely available, huge profits were possible. At length the problem was solved. A company was formed. A plant was built. It started operations. That year, the industry went completely to a new process. It no longer made the waste product, but the men who had found a use for it had never thought of that.

A knowledge of the scientific tools employed in industrial research, skill in employment of precise language, and an appreciation of the commercial factors involved, can be acquired by training. Every man engaged in industrial research should secure this equipment. Every employer should by examination, or by examination of the record, make sure the man he employs is so equipped.

It has generally been assumed that experience plays a vital role in industrial research. And with this assumption there can be little quarrel. It is true that one of the greatest chemists of all times, Perkins, later Sir William Perkins, discovered mauvine at the age of 18, and gave birth to the entire modern aniline dye industry. But there are no Perkins seeking employment in modern industry; or if there be, the employer will have difficulty in recognizing them. It is safe to say that experienced men are better equipped to carry on an industrial research program than those fitted by training alone. But what kind of experience helps the researcher best? What kind should the employer seek in the background of the man he puts in charge of his research and development work?

On this point there is indeed a difference of opinion. After some twenty years' employment by chemical industry, primarily in research and development work, the writer is convinced that industry's demand that the research man be experienced in the specialized field in which he is to be employed is highly questionable. Instead of the paint manufacturer seeking an expert paint man to examine his problem, an expert research man with broad knowledge of plastics, metallurgy, and wood preservation, would serve his purpose to much greater advantage. For creative research, specialized experience is practically worthless. It may even be a handicap. What is required is experience in the very special technique of research. And this technique can be acquired best by a heterogeneous experience, rather than concentration in a single industry.

Hiring From Competition

Of course, if you want to employ the methods used in Jones' plant, a skilled exemployee of Jones can introduce them into yours. Companies which succeed, however, are those which pioneer and keep several steps ahead of the Jones.' Those which copy the developments of competitors, are always in the rear, if not in arrears, and always dropping further and further behind. If you wish to hire a man experienced in your own industry, engage one you think can do for you more and better work than he has done for your competitor, not one you expect will bring

you the fruits of the work paid for by others. If he is worth his salt he won't do it. If he isn't, don't employ him.

If you want to do something that no one else in the industry has ever done, don't employ a man whose outlook on the problems has been conditioned by years of thinking in the same grooves. It is hard enough for the ungrooved mind to think clearly and originally. It is only the genius who can think originally after years of conditioned thinking. The industrial research chemist is not, as a rule, a genius. When he is, he is usually unemployable.

In discussing a problem in electrolytic iron recently, an outstanding electrochemist, who has won most of the rewards our profession can bestow, said "I want to get a good research man on this; and I want some one who doesn't know a thing about electrochemistry, and darn little about iron." Only he didn't say "darn". The man who spoke was preeminently a research man himself. His is the right point of view, and it is the view industry should adopt.

If you will glance through the ads in the technical journals you will see that those advertising for research men want men experienced in their own industry. The advertiser would do much better to get a man who had done well in one or several related lines of work; and he would probably do at least as well if he took a man from an entirely different field. Every job that he has which enlarges his experience, increases a man's skill in research. Every one which gives him a deeper insight into one particular field of interest, handicaps his creative ability.

But the employer is not alone at fault. Recently a number of men were interviewed for employment in research. Although the particular employment called for research in a novel field, and none of them had experience in this field, each one tried to prove his eligibility by reference to work as closely related to this employment as possible. And that very point of view was enough to make these men ineligible.

Can Absorb Environment

A research man is one who is skilled in research, not in plastics, nor sugar, nor cellulose. Research demands a special technique quite unrelated to any particular industry. Led by the textbooks, the journals, and patents; and with an opportunity to live in the atmosphere of an operating plant, to discuss production problems with managers, foremen, laborers, salesmen, and the skilled chemists and engineers actually engaged in production and distribution, it should not take long for the research man to get a working knowledge of the industry in which he is to apply this technique. And he should be able to bring something from apparently unrelated experience to bear on the immediate problem. And he brings to it a vision unhampered by routine, a fresh point of view, and the ability to do creative thinking.

Pertinent Points:

Copying Developments of Competitors Leads to Industrial Suicide.

Experience in the Same Industry Is Not a Prerequisite to Doing a Good Research Job.

A Research Man Is One Who Is Skilled in Research, Regardless of the Industry in Which He Has Been Applying His Technique.

The research man can pick up a working knowledge of any industry in a reasonable time, but if he is not a research man, twenty years' experience as a production man will not make him one.

The equipment which best fits a man for industrial research has been examined. It may be summarized briefly: First, a sound training in the scientific tool subjects; second, skill in the use of languages with precision; third, a knowledge of industrial equipment and design; fourth, the ability to examine commercial factors including markets and resources; fifth, experience in industrial research technique, unhampered by too much concentration in a specialized field.

Just what is industrial research technique? A volume on the subject would not help the employer to recognize it in an applicant for a job, nor is it likely that a questionnaire could reveal it. You have to observe the man who has it in action before knowing he has it. Then it is unmistakable.

It begins with a basic outlook on life. One must be completely certain that nature is forever true to herself, is immutable, can not be beguiled nor circumvented. But one must be equally assured that nature will work for one's own ends, if he will but fully understand her, and follow her rules. And one must have a sort of awe, a holy reverence and a passion for truth. One must recognize that the power to see and reason truly, is one that requires rigid self discipline, a constant guarding against the influence of hope or fear, against preconceived opinion. Huxley has put it: "The man of science has learned to believe in justification, not by faith, but by verification." With this ability to see truly, must come a recognition that there is nothing, no matter how trifling, that is unimportant.

But it is not enough to see the trifling, the industrial researcher must see it in relation to his whole problem. Very frequently the crux of a problem lies in some apparent trifle. An industrial chemist was called into a plant which was making a molded electric unit. A powder was poured into a mold and then compressed. For several years such units had been produced successfully, but on a new design a slight change in the preparation of the powders had been necessary. The powder was granulated by pressing it through a screen. Suddenly the products from the production line became worthless. None of them met the electric specifications. Some were high, some low. When the research man arrived at the plant it had been idle for half a day. Sixty men came in on the new shift, merely to stand idly by their machines. The research man started operations, and kept them going intermittently for several hours. He questioned and cross-questioned. He took over complete units of operation and ran them with his own hands. The president of the company watched him and came to his elbow about every half hour. "Are you getting anywhere?" he would ask anxiously and as the chemist shook his head, would tear off to his office. The chemist was not getting anywhere. He was trying to see, what had to be somewhere, and what had to be a trifle. Anything big would have been obvious to the workmen, to the plant managers and the other men who had been running this same operation for years.

Trifle Showed Up

And of course, the trifle showed up. The chemist observed a workman change a screen, and learned that during the granulation the screen wore out. As the screen was made of copper with electric properties quite different than those of the molding powder, and since the copper worn from it had to mingle with the powder, it naturally modified the molding powder and products made from it were outside the specifications. When the screen was changed to a material which did not wear away, the plant swung back into normal production. A trifle; but it had to be seen, and it had to be seen in connection with the problem.

The failure was a great mystery until the trifle was noted. But the researcher doesn't believe in mysterious things; he believes there are things we don't understand, but given time and skill that they can be understood. The researcher dares not acknowledge mystery in industry, for he feels that his entire efforts are merely applying organized common sense to the matter he investigates.

More than 8,000 taxpayers descended upon public hearing when New York State budget for 1940 was discussed. Meeting had to be moved from legislative chambers to Albany armory.

INDUSTRY'S STAKE
In Local Tax Reduction

By E. M. Allen, *President, Mathieson Alkali Works*

The Author, a Leader in the Taxpayer Association Movement Which Seeks Elimination of Waste and Introduction of Business-like Methods of Purchasing in Local and State Bodies, Shows the Necessity for Business Executives to Interest Themselves in Local Taxes; Shows Also How Economies Can Be Effected.

THE economies achieved in the cost of local governments by the taxpayer association movement have attained proportions that warrant the attention of industrial manufacturers who wish to reduce their tax burdens and, at the same time, desire modern public services in their home communities.

The taxpayer movement was coordinated on a national basis when the recent Conference of Eastern State Taxpayer Association Executives passed a resolution naming The Tax Foundation of Rockefeller Center, New York, as a national clearing house for the movement.

The savings for taxpayers resulting from the work of the Westchester County Taxpayers Association are typical of the movement, which has spread in recent years, to more than twenty states. For 1939 the Westchester County Board of Supervisors proposed a budget of $20,532,000. This was $4,482,000 more than the 1938 budget and $3,746,000 more than the amount actually appropriated in 1938. Our association lost no time in attacking the departmental requests. At a meeting at the County Center, over seven hundred taxpayers protested against the budget increases and backed their demands by petitions signed by more than twelve thousand citizens. As a result nearly $5,000,000 was cut from the budget which, when finally adopted, was lower by $918,000 than the amount appropriated in 1938.

The 1939 county budget had scarcely been adopted when reports from Albany indicated that the New York State budget for the 1939-1940 fiscal year would probably set an all-time high record. Our association rallied organizations in cities, towns and hamlets from one end of the State to the other. At a public hearing held in the Assembly Chambers at Albany, six thousand citizens registered their protest against the proposed state budget of $415,000,000, and against any new proposed taxes. The protest had the immediate effect of killing the proposed new real estate and business turnover taxes. It halted the upward trend of state spending, brought the economy issue into the open and resulted, finally, in a $25,000,000 cut in the state budget.

In many other sections of the country substantial economies in local government costs have resulted from the informed action of citizen taxpayer associations.

The fight for economy of the Nebraska groups has reduced property taxes in that state by $159,000,000. The debt of local government units has been reduced by $28,000,000 in the last 10 years. The movement started with a militant group of taxpayers in Fullerton which has a population of only 1,600.

In South Bend, during the eight years' activity of the Civic Planning Association, there has been a decrease in annual expenditures of nearly $2,500,000, and

ADVERTISING PAGES REMOVED

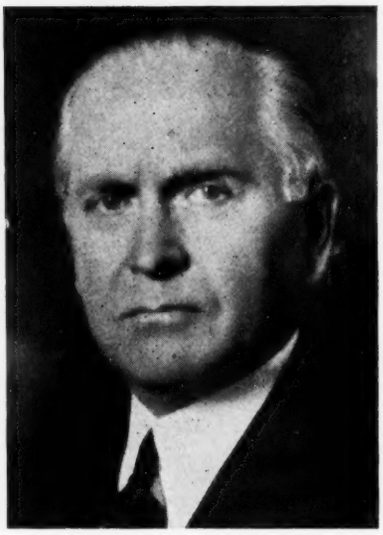
this despite the fact that relief costs have increased $853,000. South Bend's debt has been cut nearly in half, with an annual interest saving of about $400,000.

The Alameda County Taxpayers Association in California has participated in tax reductions totaling more than $506,000.

The Kentucky Tax Reduction Association, formed in 1933, has prepared and published studies of the fiscal affairs of six typical Kentucky Counties. These studies became the basis of county reform legislation which was enacted by the Kentucky General Assembly in 1934. The association estimates that this legislation was instrumental in reducing county expenditures by $3,000,000 in the first year. Another result was a permanent reduction of $500,000 a year thereafter.

The Citizens' Tax Research Committee of Hammond, Indiana, conducted a survey audit of the city and school governments for the past four years. The results of the survey furnished the basis for a demand for reduction in government costs and led to a cut of $283,000 in taxes proposed for 1940.

These instances, selected from many, illustrate the practical value of organized citizen activity for economy in local government. This work is of vital importance today because, with $4,000,000,000 recently added for rearmament to an all-time-high cost of Federal government, there seems little likelihood of relief for the overburdened taxpayer in this direction.



E. M. Allen

However the Federal tax burden is being offset in varying degrees in many communities through eliminations of waste and inefficiency in local governments. The following are typical of some of the methods of operation in these governments, which taxpayer groups are revealing and calling to public attention:

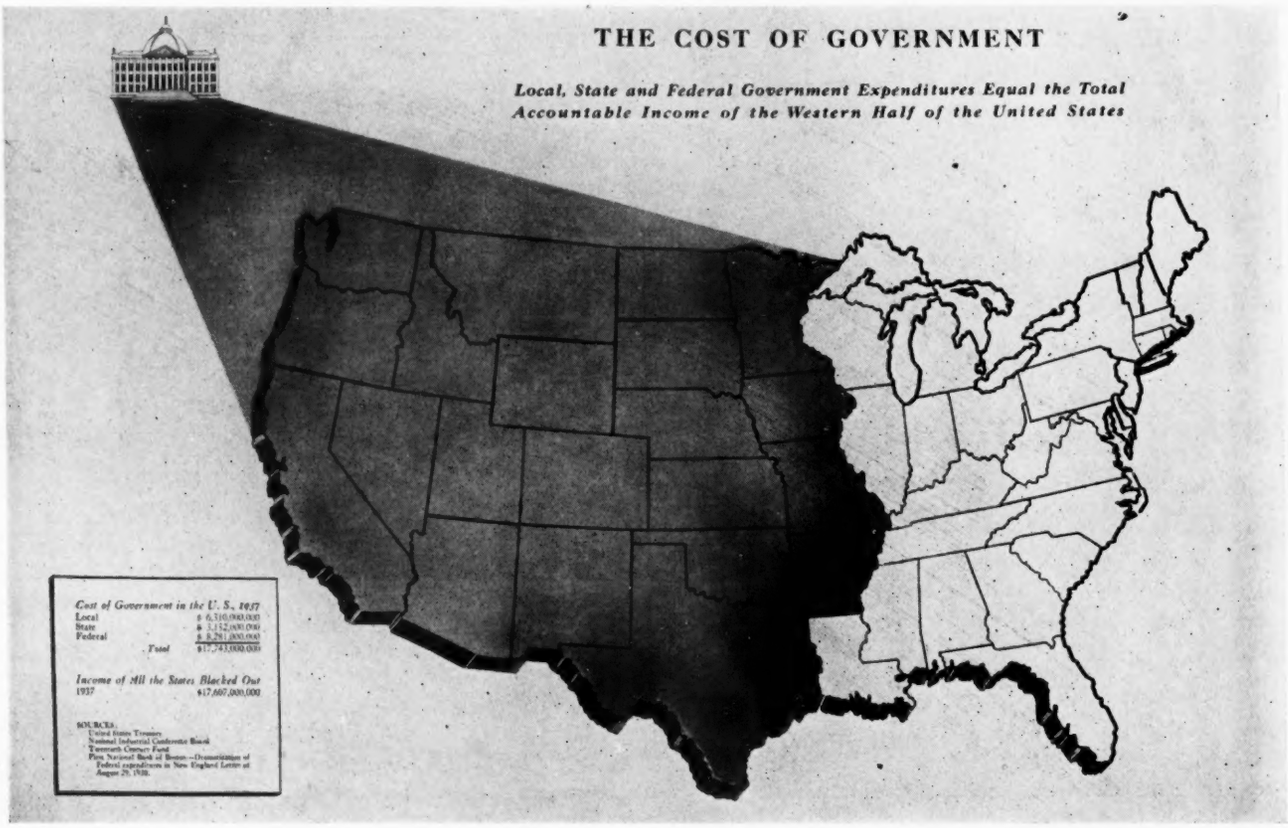
Signing of blank cheques against future expenditures; heavy mileage expense bills sometimes at 10-15 cents a mile allowed to county supervisors; no specifications written on purchase vouchers; no detailed budget proposals presented to citizens; total departmental requests only.

No public hearings called on proposed budgets for the coming year; part-time jobs given to public officials which could be consolidated at substantial savings to taxpayers; County supervisors' reports give no specifications on expenditures, only amounts and names of recipients; the citizen doesn't know what his money went for; amounts budgeted are not given with amounts spent by various departments; the citizen doesn't know where or how the budget was exceeded; expenditures are often charged against department appropriations with which they are not related.

No control exercised over the purchase of land and prices paid for highway rights of way; unnecessary borrowing year after year instead of increasing tax rates; gasoline and other supplies bought at retail with no quantity discounts.

No effort made to plan or check monthly expenditures in order to keep within the budget; no independent audit made of public expenditures; no allowance made for reduction of funded debts; thus interest piles up; no referendum held on the issuance of new bond issues for public works; no general ledger kept so that officials can determine the total status of public funds at any time.

Literature such as that shown below is released from the Tax Foundation, coordinating group.


THE COST OF GOVERNMENT
Local, State and Federal Government Expenditures Equal the Total Accountable Income of the Western Half of the United States
Cost of Government in the U. S., 1937
Local
State
Federal
Total
Income of All the States Blocked Out
1937
SOURCES:

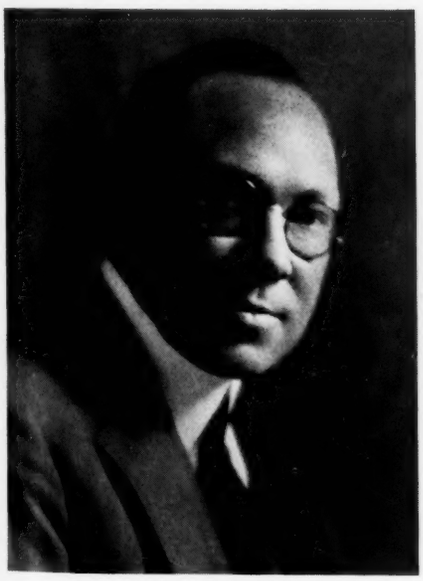
"Headliners" In the News

Lois Wendt, Queen of Dow's Field Day, was awarded a free trip to New York World's Fair by company. When she arrived, Bell Telephone promptly awarded her a free call home. So-o-o, Miss Wendt was photographed while talking to her mother.

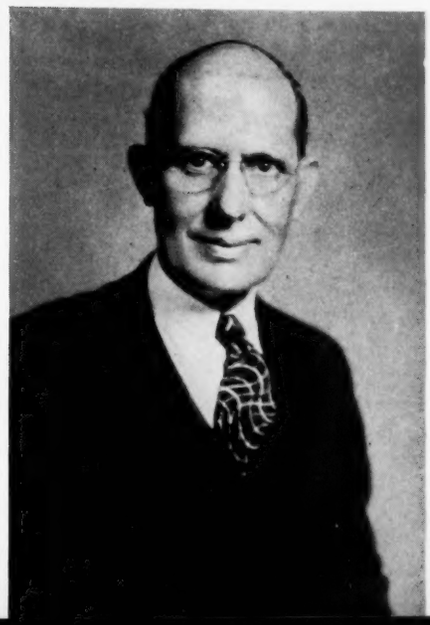
Dr. Paul V. McKinney has been appointed director of research by The Neville Company. Dr. McKinney left position of Senior Fellow in work of Texas Gulf Sulphur at Mellon Institute.

Harvey P. Thelen has joined Owens-Illinois Can Company as assistant manager of oil and paint container sales. He was formerly assistant manager of steel package sales for Geuder, Paeschke & Frey.

Lincoln T. Work, associate professor of chemical engineering at Columbia, has been named director of research, Metal & Thermit Corp. He will supervise all research and development work for the company.



George M. Dunning has been placed in charge of general Eastern sales for Michigan Alkali. Mr. Dunning, in 1904, joined Edward Hill's Son & Co., which subsequently handled Michigan Alkali sales.

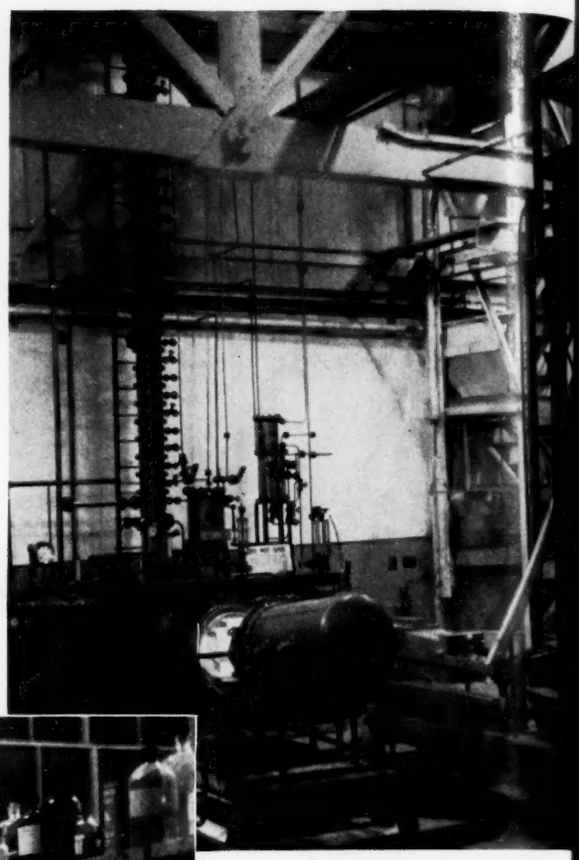


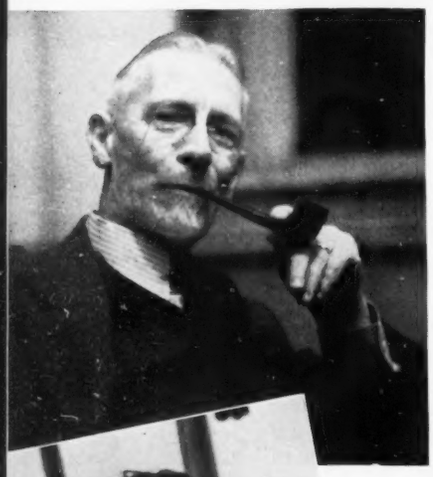
Charles F. Kettering, vice-president and director, General Motors, has been appointed honorary chairman of A. C. S. 100th national meeting to be held in Detroit, Sept. 9-13. Stress will be laid on chemistry's role in national defense.

Technicians

J. C. Olsen, professor of chemical engineering, pores over a sheaf of reports in his office. Known to more than two decades of "Poly" students as the "district attorney," Dr. Olsen has been an outstanding factor in the development of the profession of chemical engineering.

View in the chemical engineering laboratory, Brooklyn Poly. Looking over Kelly and Shriver filters to see Vulcan experimental still (30 plate columns vapor, vapor and alcohol receivers, etc.).





Beloved B. P. Caldwell, distinguished professor of physical chemistry.

Below—Graduate student, Joe Percy, conducting an experiment in the research laboratory of organic chemistry.

Paul Brinns, assistant professor of chemical engineering.

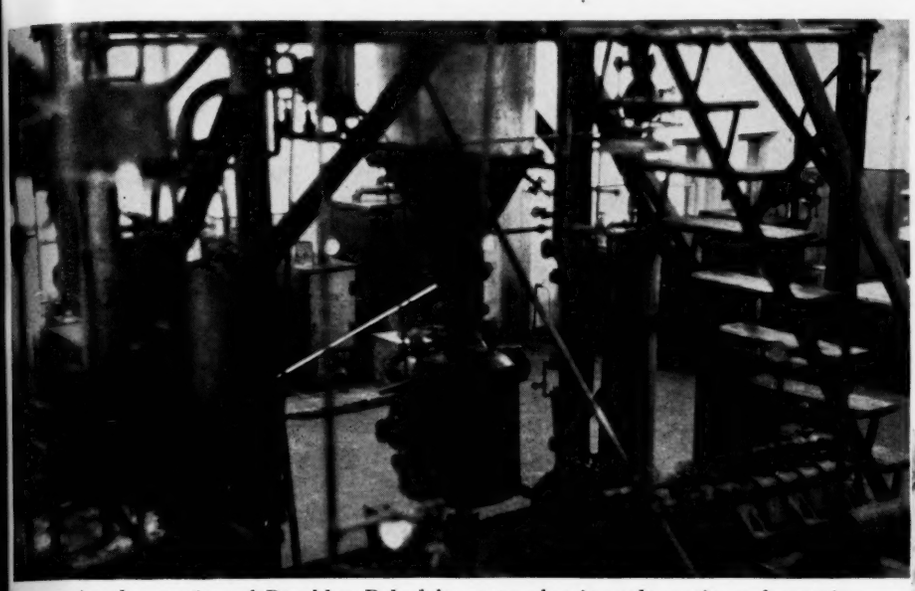
Right—A. Bartojics is research assistant, Shellac Research Bureau.

Raymond E. Kirk, head of the department of chemistry and professor of inorganic chemistry, ably fills the chair of the late Dr. Irving W. Fay.

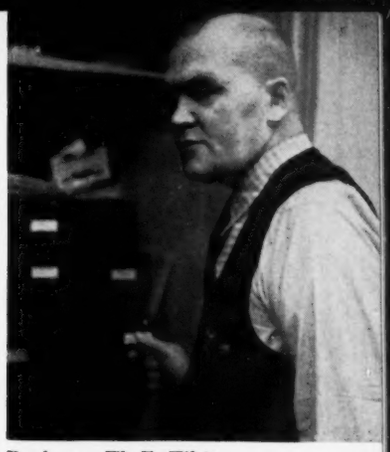
William Sartori, research assistant, in shellac research laboratory.

In Training

Chemical Industries' Candid Camera visits one of the oldest and outstanding engineering schools of the Metropolitan Area. In recent years much stress has been placed upon the training of graduate students, many of these doing their graduate work in the evening while engaged on research, control, and production in industry.



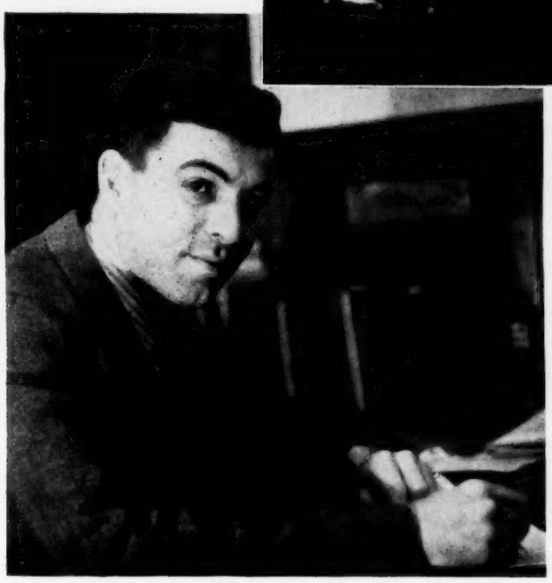
Another section of Brooklyn Poly laboratory, showing salt receiver of experimental Vulcan evaporator with Sweetland Filter in foreground and gas fired oven in background.



Professor W. F. Whitmore sheds his suit coat when not bound by classroom conventions. He is considered one of the country's authorities on microscopy.

Professor Paul Spoerri relaxes for a few minutes for "C. I." 's photographer.

William Howlett Gardner, research professor of chemical engineering, is supervisor of shellac investigational work, for which the name of Brooklyn "Poly" has now become internationally famous.



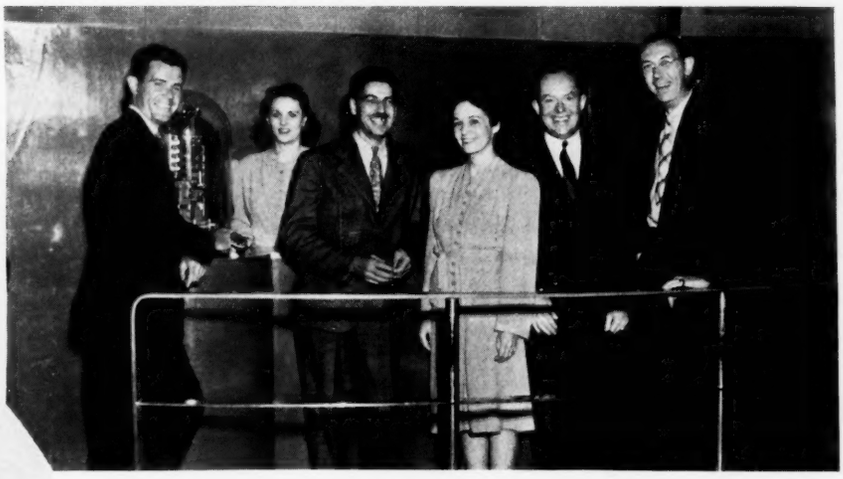
Donald F. Othmer, professor and head of department of chemical engineering.

H. H. Bassford (left), research associate, and C. Fragola, research fellow, M.E.E., both work on shellac bureau research.

Professor Roland Ward (left) chats with Norman Wittenbrock, graduate fellow in inorganic chemistry.

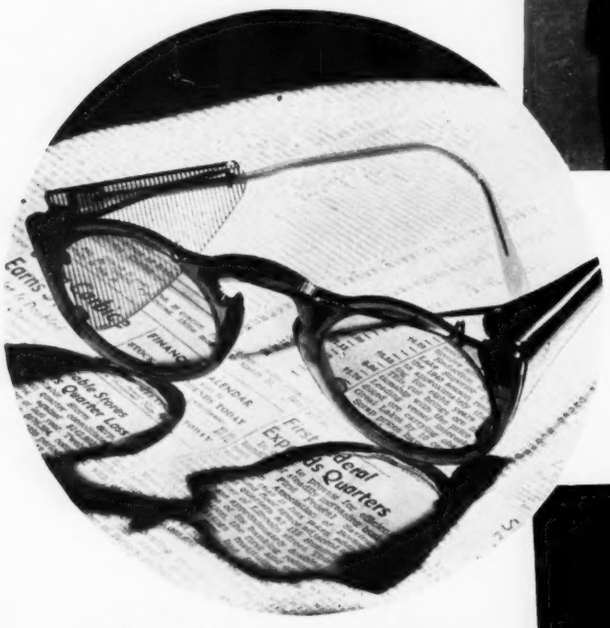
EMOVED

Merck, Rahway Division, employees contributed nickels and dimes to buy this new giant American flag as a gift to the company. It now waves over the plant daily. George W. Merck (inset), president, spoke before a large open-air audience in accepting the flag on behalf of the company.



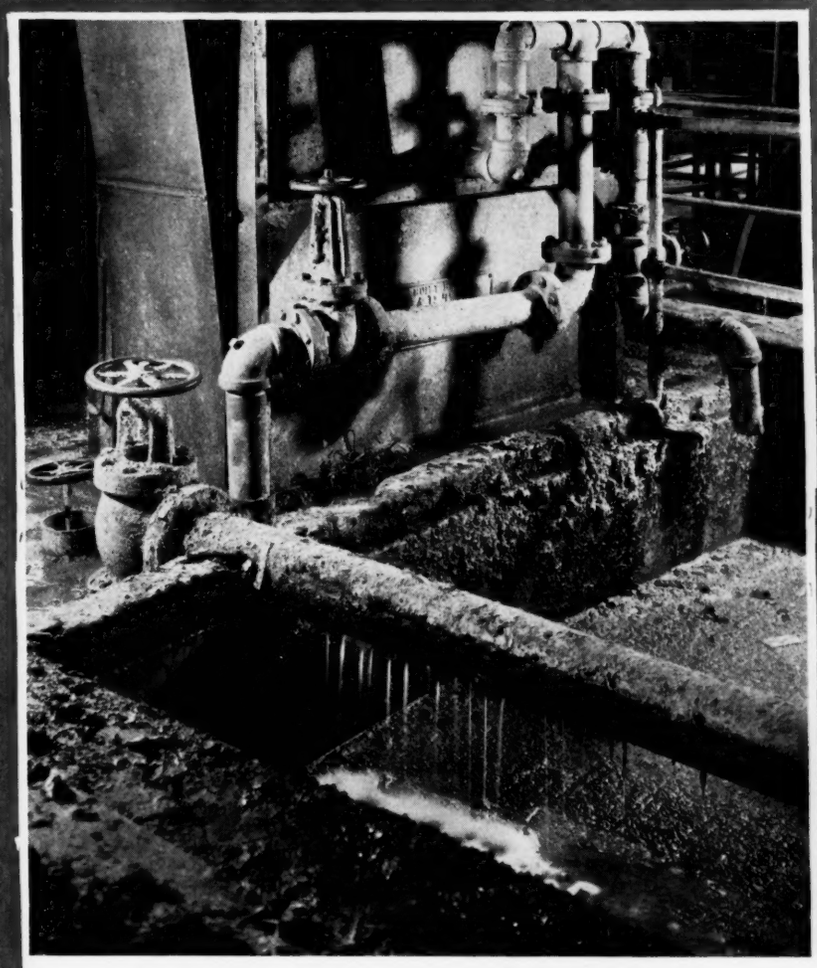
Chemical and advertising executives tested their speaking voices at Telephone exhibit at N. Y. World's Fair. They are (l. to r.) Harold J. O'Neil, Fisher-Stevens Service; Walter Correll, Merck, Julia Sweeney, Bell Exhibit staff, Thos. J. Clark, Fisher-Stevens, and Edwin H. Rauth, Schering Corp.

Polaroid variable day glasses represent a new departure in eye comfort regardless of the sun glare in any scene contemplated. Each eye looks out through two Polaroid lenses. Front lens before each eye is stationary in frame, while two rear lenses may be rotated by a button on the bridge of the frame. Polaroid Corp., Cambridge, Mass., is manufacturer.



National Chairman John D. Hamilton used gavel made of Plexiglas, Rohm & Haas acrylic plastic, to open Philadelphia Republican Convention. Francis Abbott, Philadelphia vocational schoolboy, made it as part of his school program, and presented it to the chairman at the convention.

PLANT OPERATION AND MANAGEMENT



Corrosion—Parasite of the Chemical Industry

Industrial research by plant engineers has long been a fight against the destruction and waste wrought by corrosion. H. J. Bartlett, sales engineer of Crane Co.'s Valve and Fitting Department, discusses in the following pages advances made in combating its destructive influence.

DIGEST OF NEW METHODS AND EQUIPMENT FOR CHEMICAL MAKERS

CHEMICAL INDUSTRIES

COMBATING CORROSION
Through Metallurgical Research

By H. J. Bartlett, *Sales Engineer, Crane Company*

Chemical and Metallurgical Engineers Have Long Been Allies in a War On Corrosion in Industrial Piping and Equipment. Our Author Discusses the Results of Their Campaign.

IN the chemical industry, where purity is virtually the standard of quality, corrosion can easily become a nightmare to plant executives. For corrosion, even in a mild form, is the despoiler of purity—hence of quality.

No phase of industrial piping has challenged the engineering and research scientist as much as corrosion. Many times, it is not known that corrosion exists, which makes it doubly menacing.

Over the years, during which the chemical industry of the United States has grown to maturity, much time has been spent by engineering and research men in cataloging a wide variety of corrosive elements. With this unmasking of the foe, the fight became equal, and science has won out to a great extent, at least, through the development and use of metals and alloys whose constituents are impervious to corrosive action.

The problem of corrosion is, naturally most commonly encountered in the chemical industry, and those industries in which chemicals play an important part in process work.

The processes employed in the making of chemicals are almost as varied as their products, and yet there are certain mechanical steps common to all of them, such as grinding, furnacing, dissolving, separating, evaporating, filtration, and crystallization. Likewise, in industries that do not make chemicals but use them in making other products, mechanical processes of various kinds are used, in which certain chemical laws must be recognized and obeyed, in order to avoid contamination of the product or damage to the equipment.

Here is where the equipment manufacturers can render a service which may turn failure into success by offering mechanical devices made especially to cope with the many problems encountered in the use of chemical agents.

In the piping field alone, valves and fittings are made in a large variety of metals and alloys to meet the exigencies of process production. Specifications for such products are based upon sound engineering principles, practical experience, and extensive research over a period of time. Not only are they designed and built to meet corrosion and scaling resistance, but with proper strength at normal and elevated temperatures, welding characteristics, impact or shock resistance, and so on.

Soot blower and spill lines from absorption towers.

Metallurgical and research scientists agree that there is no "cure-all" against corrosion. Due to the wide variety of known chemical agents and the different alloy materials now used in industrial process piping, it is impossible to find a pure or alloyed metal impervious to all kinds of chemical solutions. Some alloys seem to have an affinity for certain chemicals; others are just the opposite.

The only sure way to ascertain the corrosion resistant properties of a metal is by experimentation. This kind of research has been going on for many years, and, up to the present, factual knowledge has been obtained on the corrosion resistance of a number of metals and alloys, used in the manufacture of valves and fittings, to nearly 200 different chemical elements. These materials include 18-8 Mo., monel metal, nickel, Everdur, Nn-resist, and all-iron.

18-8 MO.

There are several different kinds of chromium-nickel steels in use today, without which the chemical industry would be seriously handicapped. The 18-8 MO steel is an exceptionally high-grade, stainless steel that is highly resistant to corrosion, and finds wide application in

H. J. Bartlett

the chemical paper, textile, dye, and related industries. Its corrosion resistant properties have been materially increased by the addition of molybdenum to regular 18-8 chromium nickel steels.

Valves and fittings made of 18-8 MO alloy steel are especially serviceable in handling acetic acid, nitric acid, alum solutions, alkalies (such as caustic soda, soda ash etc.), limes, bleaching solutions, corrosive mine waters, fatty acid, food products, fruit juices, sulfite liquors, and vapors in paper mills, sulfurous acid, tanning liquors, and other industrial chemicals.

Monel Metal

This well-known alloy contains 67% nickel, 29% copper. Its high strength, ductility, and excellent resistance to corrosion makes it ideal for piping installations in the bottling, brewing, canning, ceramic, chemical, dyestuffs, food, paint, refining, rubber, soap, sugar, tanning, textile, and their related industries. It is especially recommended for handling solutions of the chlorides and varying concentrations of sulfuric acid up to about 80 per cent.

Iron valves, with monel metal trim, are sometimes substituted for all-monel valves where first cost is important and slight contamination is not objectionable.

Pure Nickel

Valves and fittings made of commercially pure nickel (97 per cent.) give excellent service in handling chloroacetic acid, calcium hydroxide, fruit juices, gallic acid, hydrochloric acid, magnesium chloride, sodium chloride, sodium hydroxide, food products, and a large number of other industrial chemicals. They are widely used in handling caustic soda, and in the dyeing industry where contamination from iron must be avoided.

One of the most useful properties of nickel is its practically complete resistance to corrosion by solutions of the alkalies. Due to this characteristic, extensive use is made of nickel in the manufacture of "fixed alkalies" and "alkaline salts." It is not widely used in the handling of mineral acids, but does find some application to other fluids in which these acids are present as incidental impurities.

Nickel-trimmed iron valves are used in some lines handling caustic alkalies, food products, rayon, and other industrial chemicals where some contamination is permissible, but protection of seating surfaces against corrosion is desirable, at lower first cost.

Everdur

Here is an alloy containing nearly 95% copper. Its physical properties offer good resistance to a number of corroding agents, such as sulfuric acid, alum solution, calcium chloride, chloroacetic acid, carbon tetrachloride, hydrofluoric acid, hydrobromic acid, hydrochloric acid, and oxalic acid, phosphoric acid, zinc sulfate.

Everdur is not recommended for service with chromic and nitric acids because it does not give satisfactory corrosion resistance to high oxidization.

Ni-Resist Cast Iron

This alloy was developed specifically for installations where the service conditions encountered in modern industry indicate that a vast field exists in which fluids to be handled necessitate a less active metal than cast iron, but in which the cost of special corrosion resisting valves and fittings is prohibitive. It contains about 20 per cent. of monel metal, in fact, it was once commonly known as "monel cast iron."

Ni-Resist has a much better resistance than cast iron to solutions containing sulfuric acid, such as mine waters, and is frequently used on low concentration of the acid itself.

It gives excellent service on sulfate liquors used in the manufacture of "kraft" paper. Valves made of this metal are usually trimmed with 18-8 or monel.

First cost is between cast iron and the strictly high-alloyed materials, such as 18-8, but the inherent durability of such an alloy enables it to justify its higher cost in many situations where erosion and wear are involved along with corrosion. Also, it shows greater resistance to scaling and growth than ordinary cast iron.

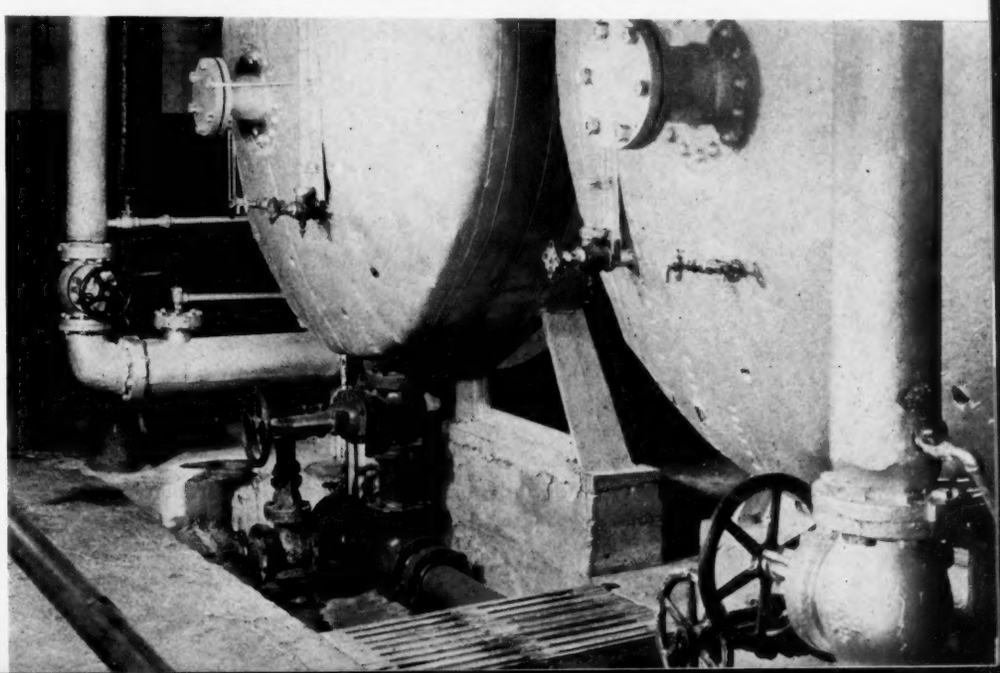
All-Iron

Although cast iron cannot be listed specifically as one of the corrosion resisting metals, its general reliability under neutral and slightly alkaline environments, together with its low initial cost, makes it a material which will give economical service in innumerable installations. It is resistant somewhat to the corrosive action of sulfur and the sulfides, and in the absence of moisture can be used to control the flow of such gases as chlorine and sulfur dioxide.

On the whole, all-iron is not suited for use in service handling mineral acids (other than sulfuric acid) and acid salt solutions. The initial corrosion product, being generally quite soluble in the corroding fluid, washes away, leaving the metal surfaces bare for repeated attacks. In some installations, however, the initial corrosion is followed by the formation of protective coatings, which either slow up corrosion or entirely prevent it.

Under sulfuric acid service all-iron is satisfactory in handling acid of a strength between 90% and 100%, even at temperatures up to the boiling point. Beyond that, however, the rate of attack becomes too great to permit the use of iron.

Steam control valves into cookers and mash lines out of cookers.

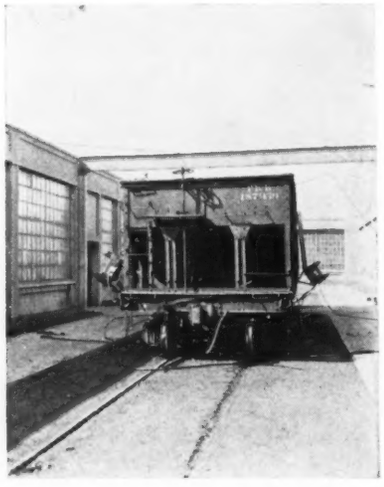


NEW EQUIPMENT

Vibrator for Unloading R. R. Cars

A new large vibrator, fitted with hooks as illustrated for attaching to hopper bottomed railroad cars, has been developed to speed up the process of emptying cars. It is said that initial installations show that two men working with two vibrators can unload a car of fine coal quicker than six or eight men can by sledging and poking.

The vibrators are huge pulsating electro-magnets striking 3600 times per minute and together with the hook weigh 950



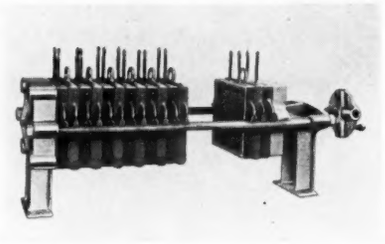
lbs. each. They are used in pairs, two to a car on opposite end sides. Each vibrator comes with a separate electrical control panel that contains a thermionic valve for changing alternating current to pulsating current, operating switches, and a variable resistance for controlling the vibrator's amplitude of power. The equipment is designed to operate on 220 volt, single phase, alternating current.

New Raschig Rings

Users of experimental columns should be interested in a new Raschig ring that has been put on the market. This new ring is made of porcelain and has a ¼" O.D. The wall thickness is 1/16", with about 85,000 rings required per cubic foot. The per cent. free space is about 55%, and there are about 212 sq. ft. of absorption surface per cubic foot. It is said that this is the smallest size ever attempted, and that the commercial production was made possible through an entirely new extrusion method.

Heated Filter Press

An innovation in filtration equipment is a new filter press, with filter plates equipped with electric heating elements cast into the plates and terminals projecting above the plates for quick and easy hook-up to electrical feeder wires. This type of filter is valuable in experimental and production work on thick, heavy, or viscous materials such as resins and plastics which must be heated during filtration to increase the flow rate of the material under any pressure.



This particular unit illustrated has 8 chambers with 4 sq. ft. of filtering area. Filter presses with larger plates and frames and greater capacity, built of any metal may likewise be provided with electrical heating elements.

Electric Stop-Watch

Ever since Michael Faraday noticed the twitch of a galvanometer needle when he moved an iron magnet inside a coil of wire, electricity has been made to tackle new jobs, bridging the gap between the electrical research laboratory and practical industry.

This time science puts the principle of the electric clock to work in revamping the old-time stop-watch, and the result is a new electric stop-watch called "Time-It." It is run by a synchronous electric motor whose speed is controlled by the power house master clock which governs the cycle constancy of alternating current.

Instead of the ordinary watch dial the

new electric stop-watch has a direct reading counter so that mistakes can't possibly be made in reading even to 1/10 second. Time intervals up to 2 hours 46 minutes, equivalent to ten thousand seconds, can be read directly to 1/10 of a second.

The new electric stop-watch can't be carried about in the pocket, but can be put to work wherever it can be plugged into a 110 Volt A.C. line.

New Products

Varno-Cement

Varno-Cement is a new, light colored, synthetic, adhesive cement for the laboratory and shop. It is said to make joints of extreme strength between cracked or broken parts of metal, wood, crockery, glass, tile, leather, rubber, and plastic products, etc. The manufacturers also claim that it is resistant to dilute acids, alkalies, water, and grease.

Bakeflex

Bakeflex is a new transparent finish for floors, table tops, counter tops, and bar tops. It is said to protect these surfaces from burning cigarette butts, stains, alcohol, mild acids, and oil or grease. According to the manufacturer the bakelite base gives the product its valuable properties. It is applied simply by spreading on with a brush or cloth.

Mased Lubricant No. 177

There is now being offered for the lubrication of ball and roller bearings, on machinery used in the chemical industries, operating at temperatures from 0°-500° F., Mased Lubricant No. 177. At room temperature it is of a buttery consistency.

A simple laboratory test shows why this new lubricant is superior to other greases for the lubrication of ball bearings, particularly those operating under high temperature conditions.

Place in the center of an electric hot plate, a piece about the size of a pea of any grease. It will be observed that the grease will quickly melt and run away. Under similar conditions, Mased Lubricant No. 177 does not liquify but retains its buttery-like consistency.

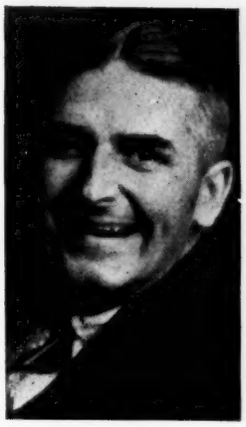
For the past two years, Mased Lubricant No. 177 has solved the problem encountered in the lubrication of dryers in the textile industry.

Arc-Resistant Molding Compound

This new arc-resistant phenolic molding compound was formulated specifically to prevent tracking where there is combined electrical spark and rubbing action. It has very high resistance to carbonization under an arc. While slightly slower to cure in the mold, its electrical properties are materially increased by baking after molding. It is said to hold its high dielectric strength when used at moderately high temperatures. It is claimed to be somewhat more flexible in its final set than standard materials and does not crack under the expansion and contraction of metal inserts around which it may be easily molded. The manufacturers designate the new material, "Durez 8685."

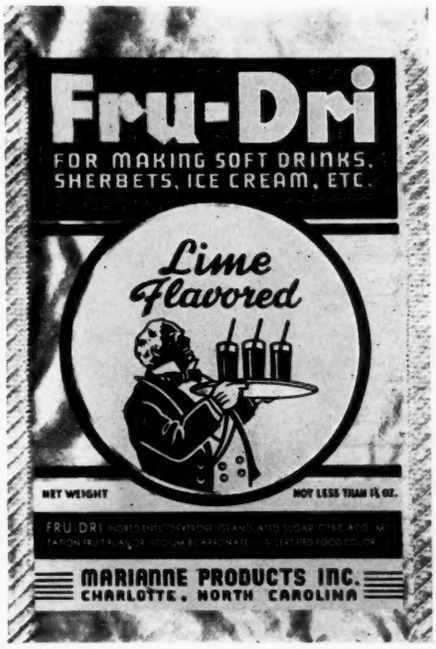
Shipping and Container FORUM

By P. W. Lahey



NEW PROTECTIVE ENVELOPE ANNOUNCED BY REYNOLDS METALS COMPANY

Reynolds Metals Company has recently announced a new type of flexible metal envelope which retards product oxidation and prevents vapor movements either inward or outward. These envelopes are designed to deliver small quantities of products which are affected by atmosphere, moisture or light to the consumer in full strength and effectiveness. They are odor proof and grease proof.



Many distinctive effects are possible through choice of label colors on Reynolds Metal Envelopes. Background of this label is blue, while excellent white ink coverage throws spotlight on product name, creating high visibility. On reverse, directions are printed in black on white background.

Aluminum Foil Laminated

These new envelopes are closed by a new type of heat-sealing which can be easily opened and yet retains its protective features in transportation and marketing.

The containers consist of aluminum foil laminated to a backing which is flexible and not affected by bending. Thermoplastic coatings which are used for lining the inside of the envelopes can be supplied in many types. These coatings include formulations of rubber derivatives, synthetic resins, and natural gums and resins in a wide variety of mixtures developed by Reynolds Research Corporation. The character of the coating depends on the Ph. of the product as well as its other physical and chemical characteristics.

Are Heat Sealed

Envelopes can be heat-sealed by several of the existing heat-sealing machines now on the market, such as the model illustrated, without alteration or special adaptations. With proper sealing equipment, normally applying heat on *both* sides of the seams, the sealing rate for these envelopes is limited only by the effective capacity of the machine. It follows, of course, that rate of sealing is to a certain extent affected by the weight of backing material and metal used in the envelope, as the heavier materials require more time for heat penetration.

Wide Choice of Color

These genuine metal envelopes can be beautifully color printed to meet the most exacting requirements. There is illustrated a striking printing design to show the wide range of advertising possibilities.

Approximate prices range from $2.00 to $6.00 per thousand, depending entirely upon size, quantity and specifications.

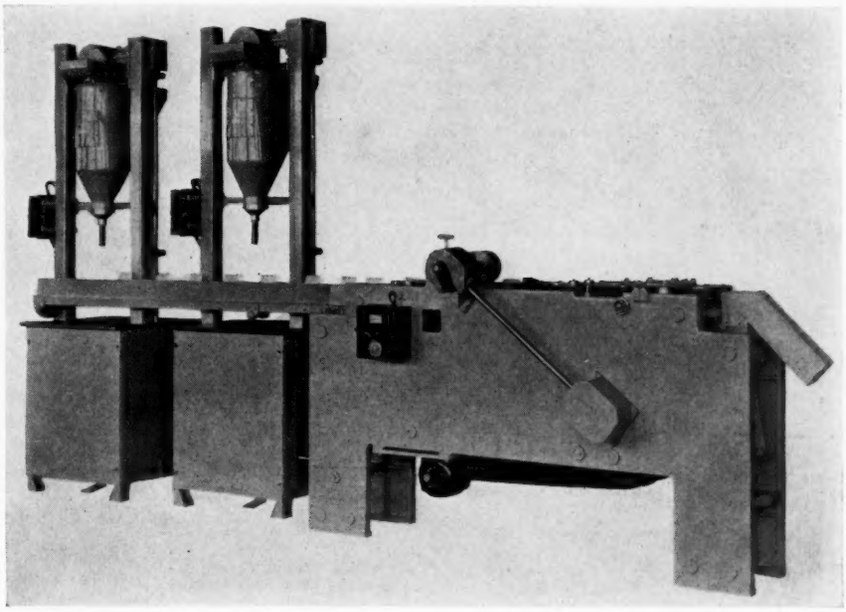
New Type Safety Vent for Sulfuric Acid Tank Cars

On May 22nd the I.C.C. issued an order authorizing the equipping experimentally of 100 sulfuric acid I.C.C. 103A tank cars with a new type safety vent which has been developed by the Tank Car Committee of the Manufacturing Chemists' Association. The feature of this development is the use of a 2 inch diameter frangible lead disc which contains a 1/16 inch breather hole in the center of the disc.

Will Reduce Hazards

It is believed that this disc will reduce hazards to workers engaged in the loading and unloading of these tank cars as the breather hole will reduce the pressure which can be built up and which is occasionally responsible for fracturing the present solid discs during transit.

This order authorizes these service trials during the hot summer months when conditions are worst. The Tank Car Committee will decide which tank cars will be equipped with this vent.



Photograph shows two Stokes & Smith Universal filling machines connected by conveyor to an envelope sealing machine. Sealing machine can be fitted to handle either glued or heat seal envelopes.

ON THE BANKS OF THE RARITAN

.... stands the Fords, New Jersey, plant of the Heyden Chemical Corporation. For well over a generation this plant has been devoted to the development and manufacture of Heyden Fine Chemicals.

HEYDEN FINE CHEMICALS

PENTAERYTHRITOL

Purified and Technical

A white, crystalline powder, non-toxic and conforming to standard specifications. PENTAERYTHRITOL is a versatile and reactive compound which has already found important use in the manufacture of such products as esters, synthetic resins and emulsifiers.

This polyhydric alcohol is now available in quantity at a reasonable cost. Capable of forming a host of derivatives, few of which have been fully investigated, PENTAERYTHRITOL merits the careful investigation of your Research and Development Division. Write for descriptive literature.

BENZYL CHLORIDE • BENZALDEHYDE • BENZAL CHLORIDE
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FORMALDEHYDE • PARAFORMALDEHYDE
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SALICYLIC ACID • METHYL SALICYLATE

Write for Current Products List

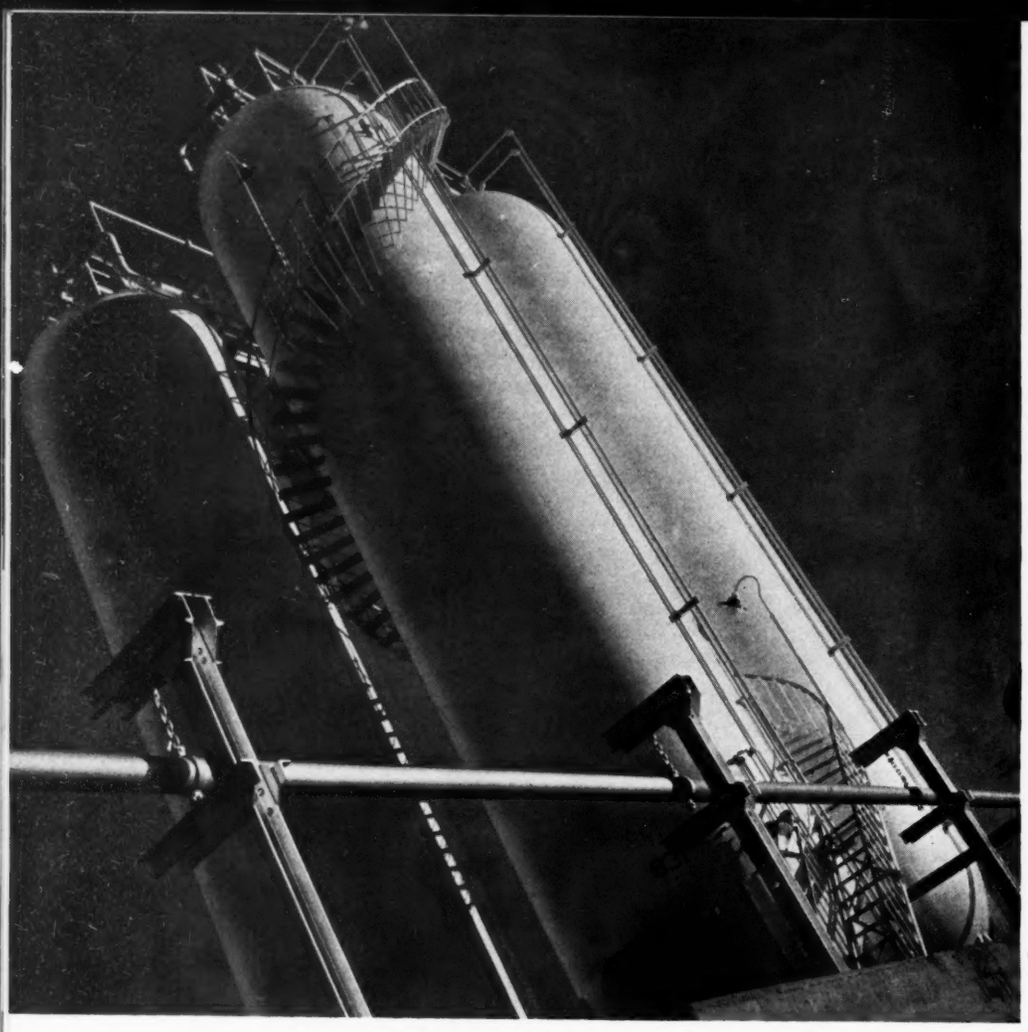
HEYDEN
CHEMICAL CORPORATION
50 UNION SQUARE • NEW YORK
CHICAGO BRANCH: 180 N. WACKER DRIVE
FACTORIES: GARFIELD, NEW JERSEY

NEW CHEMICALS FOR INDUSTRY

W. S. Farish, president, Standard Oil Company of N. J., declared that should it become a necessity, production of Butyl rubber could replace natural product for most of U. S. needs. This product is companion to much publicized Buna made by same company. Photo shows Butyl rubber in raw state.

Digest of Chemical Developments in Converting and Processing Fields

CHEMICAL INDUSTRIES



LIQUEFIED PETROLEUM GAS

In the National Defense Program

By Henry N. Wade, *President, Parkhill-Wade*

Growing Consumption of Liquefied Petroleum Gas, One-Fifth of Which Goes into Chemical Manufacture, Is Expected to Feel a Substantial Spurt When the Defense Program Actually Gets Under Way. The Author Tells How and Why in This Article Which He Delivered before the Pacific Coast Section, L. P. G. A.

THE war in Europe started as a "war of nerves." It has settled down to a war of commonplace things, such as beans and beef and guns and gasoline. And of these things, gasoline and other liquid fuel will probably decide the outcome, since transport trucks, tanks, airplanes, submarines and even battleships become useless junk without a continuous supply of the proper kinds of fuel. A country can adjust its needs for food and clothing, and shelter within wide limits, according to the necessities; but an aggressor cannot attack, nor can a defender resist, without a complete and generous supply of liquid fuels.

In view of the desperate condition of the democracies in Europe, and the obvious bearing of this condition on our own affairs, it is essential that the liquefied petroleum gas industry take a general look at its present position in the family of liquid fuels, with the purpose of determining how it can best serve in the national defense economy. It is the purpose of this article to suggest some of the trends into which the development of the use of liquefied petroleum gas should be directed in order to yield the greatest benefit in our preparation for defense, as well as in normal utilization of fuel.

First, let us examine into the general nature of the fuels classified as liquefied petroleum gas, which I will refer to hereafter as L.P.G., to see how they differ from other liquid fuels, and in what way these differences affect their production, distribution and use.

Chemically, L.P.G. consists of one or more of three definite chemical compounds, known as propane, isobutane and normal butane. All three of these materials are heavy combustible vapors under ordinary conditions of temperature and pressure, but may be liquefied by compressing to a moderate pressure, and can be stored as liquids in tanks under pressure. The pressures required to keep the material liquid at normal atmospheric temperature, say 80° F., range from 130 lbs. per square inch for pure propane down to 23 lbs. per square inch for pure normal butane. The storage pressures for mixtures of course vary between these two extremes, depending upon the proportions of propane and butanes. Storage tanks often are subject to temperatures much higher than 80° F., consequently it is necessary to use tanks designed for at least 225 lbs. per square inch working pressure for storing propane, and about 125 lbs. for butane.

This, then, is the first unique peculiarity of L.P.G.; the storage tanks must be built for considerable pressure, and are therefore much more expensive than storage for ordinary liquid fuels like gasoline, diesel oil or fuel oil. Likewise, tanks for transporting L.P.G. must be much heavier than those used for other liquid fuels, so that the ratio of tare weight to net fuel weight is higher. This last difference is partly offset by the fact that the liquefied petroleum gas weighs per gallon only about 70 per cent. as much as gasoline. Therefore, for those uses where a gallon of L.P.G. will deliver as much actual duty as a gallon of gasoline, the total or gross transport weight per unit of duty performed may be about equal to that of gasoline. Although transportation to a distance is not impractical, L.P.G. is essentially a fuel for "home" use at stationary points, and is not well adapted to military field operations.

The second fundamental difference between L.P.G. and other liquid fuels arises from its method of production. The principal sources of L.P.G. are so-called "natural gasoline" or "casinghead" plants, which extract gasoline from the natural gas produced along with crude oil from oil wells. In these plants the extraction of the light natural gasoline from the gas

normally results in the extraction of an excess of propane and butane which can be converted into commercial L.P.G. by extremely simple and cheap processing. The rate of production of nearly all natural gasoline plants is determined by the rate of crude production from the field; in other words the L.P.G. is in the nature of a by-product, the supply of which is determined largely by factors beyond the control of the L.P.G. industry itself. L.P.G. production conditions thus are similar to those for natural gas production from oil fields, in that the rate of supply is set by outside factors which bear no relation to the rate of demand, and the excess production is expensive to store away in quantity.

During the past few years the practice of storing excess natural gas production by pumping it back into the producing or other formations underground has grown rapidly, and this same method of storage may be applied to excess L.P.G. Subsequent use of the stored gas requires only that it be produced into transmission lines through existing wells, but recovery of L.P.G. stored in the same manner necessitates again running the gas through an extraction plant.

These then are the two distinctive peculiarities of L.P.G. among liquid fuels; first, it is expensive to store in large quantities, and second, it originates principally as a by-product of the production of other fuels. In order for L.P.G. to have its greatest usefulness, these peculiarities require that its utilization be expanded to the greatest possible extent consistent with the available supply. Every gallon of L.P.G. which is wasted, or which is used for purposes where a less specialized fuel like natural gas or fuel oil or coal would do equally well, requires the production of an additional gallon of war-purpose fuel to take its place.

Uses

We will now discuss the uses of L.P.G., in an attempt to evaluate those uses with reference to the national defense.

The utilization of L.P.G. falls naturally into three broad classifications according to the nature of the use, as follows:

(1) Burning Fuel.
(2) Internal Combustion Engine Fuel.
(3) Raw Material for Chemical Conversion.

Based on the figures for the year 1938 as assembled by the U. S. Department of Commerce, of the total consumption of 165,201,000 gallons, 66 per cent. was used as burning fuel, 12.6 per cent. as engine fuel, 19.6 per cent. for conversion into other chemicals, and 1.8 per cent. for miscellaneous use not otherwise classified.

As will be shown, L.P.G. possesses remarkable properties as an engine fuel; yet the above figures indicate that at present about two-thirds of the total amount sold is used for burning fuel, one-fifth is used for chemical conversion into other materials, and only one-eighth for engine fuel. The reasons for this state of affairs will appear in the following discussion of the development of the three types of use.

(1) Use as Burning Fuel

"Bottled Gas." The original application of L.P.G. was as a substitute for gas for domestic cooking and heating.

Industrial Uses. During the first years of the L.P.G. business, from 1922 to 1928, practically all sales were of the "bottle-gas" type. In this period the total sales grew from about 200,000 gallons per year to 2,600,000. In 1928 appear the first substantial sales for "industrial" use, amounting to 400,000 gallons for the year. This type of application was simply a logical expansion of the "bottle-gas" idea, extending the use of the fuel to all sorts of firing which require absolute cleanliness or exceptionally sensitive control, or both. The installations become more complicated, requiring artificial heat for vaporizing the liquid at the necessary rates of use.

The fuel is transported in rail tank cars or large tank trucks for transfer to stationary storage tanks at the point of use. Since 1928 the industrial use has grown from 400,000 gallons annually to 128,000,000 in 1939, while in the same period the bottle gas business has increased from 2,600,000 to 84,600,000 gallons.

In general the industrial applications, like the domestic, simply offer a substitute for other forms of gas service. Where natural gas is available at usual rates, L.P.G. cannot compete in cost for equal amounts of heat. Thus, as a practical proposition, its industrial use is limited to applications where natural gas would be used normally if it were available. Such uses include:

Firing ovens in bakeries.

Baking drying enamels on sheet metal parts.

Burning vitreous enamels on stoves, plumbing fixtures, refrigerator parts, etc.

Melting glass and blowing glassware.

Firing high-grade pottery.

Singeing textiles.

Heat treating and annealing tool steels, etc.

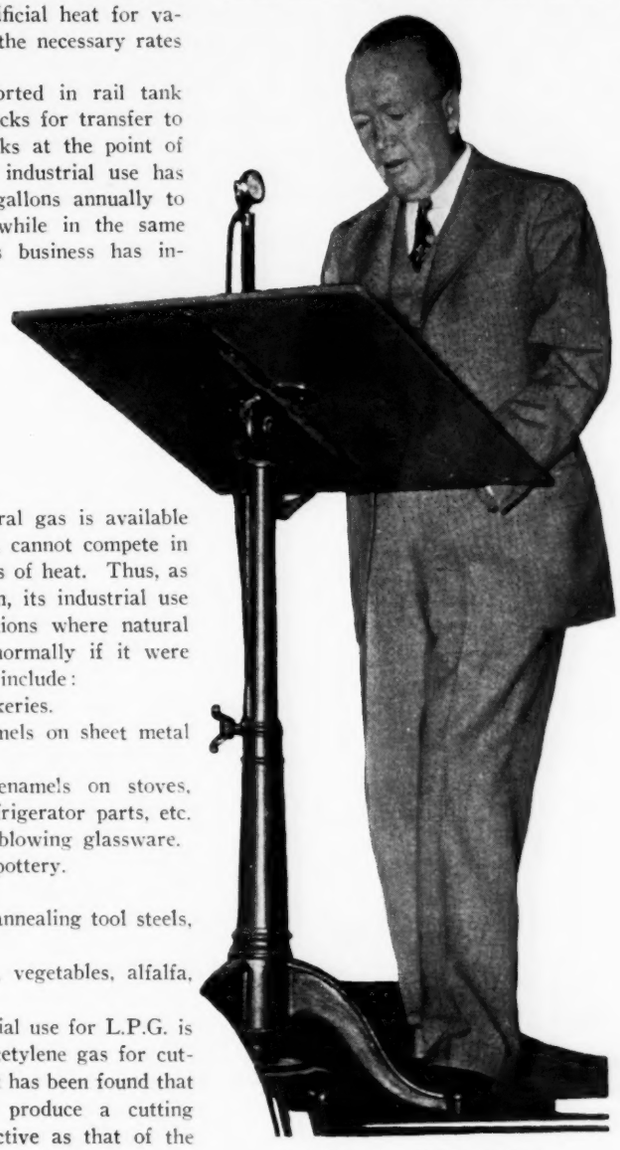
Dehydrating fruits, vegetables, alfalfa, cotton, etc.

An interesting special use for L.P.G. is as a substitute for acetylene gas for cutting iron and steel. It has been found that L.P.G. and oxygen produce a cutting flame nearly as effective as that of the usual acetylene-oxygen mixture, at materially reduced total cost. Since production of machine parts by automatic torch cutting machines is growing rapidly, this use of L.P.G. may be expected to increase.

Still another unusual use of particular interest now is the firing of mercury smelters on several California mercury properties.

Standby Plants. The use of L.P.G. for emergency or standby fuel service has been developing extensively during the past three or four years. Such plants are of two general types; those intended purely for emergency service in the event of failure of the normal source of gas fuel, and those used to supplement the normal supply during periods of peak demand. Standby plants have been built of all sizes, from an emergency plant to supply a large city at the rate of 36,000,000 cubic feet per day, down to small industrial units designed to deliver a few hundred feet per hour.

Emergency standby plants to insure the operation of vital war material factories against temporary failure of their normal



Henry N. Wade

TABLE NO. 1—SALES OF LIQUEFIED PETROLEUM GASES, 1933-38

(In thousands of gallons)

Year	Propane	Butane	Propane-Butane Mixtures	Pentane	Total
1933	15,835	19,056	3,226	814	38,931
1934	18,681	25,553	10,271	1,922	56,427
1935	26,814	34,084	13,492	2,465	76,855
1936	36,502	40,200	27,375	2,575	106,652
1937	46,474	*45,399	46,694	2,833	*141,400
1938	54,130	52,768	56,050	2,253	165,201

* Revised figures.

TABLE NO. 2—MARKETED PRODUCTION OF LIQUEFIED PETROLEUM GASES BY USES, METHOD OF TRANSPORTATION, AND REGIONAL DISTRIBUTION, 1937-38.

(In thousands of gallons)

	Propane	Butane	Propane-Butane Mixtures	Pentane	Total 1938	% 1938	Total 1937	% 1937
By uses:								
Domestic	37,556	13,194	6,316	766	57,832	35.0	40,823	29.0
Gas manufacturing	1,491	8,270	2,617	8	12,386	7.5	*11,175	7.9
Industrial fuel	14,316	23,405	1,112	16	38,849	23.5	43,310	30.6
Chemical manufacturing	347	43	30,496	1,413	32,299	19.6	26,792	18.9
Internal-combustion engine fuel	380	5,025	15,509	...	20,914	12.6	16,937	12.0
All other uses	40	2,831	.....	80	2,921	1.8	2,313	1.6
Total	54,130	52,768	56,050	2,253	165,201	100.0	*141,400	*100.0
Percent 1938	32.8	31.9	33.9	1.4	100.0			
Percent 1937	32.9	32.1	33.0	2.0	100.0			
By methods of transportation:								
Bulk	22,420	50,050	53,665	1,926	128,061	77.5	*111,474	78.8
Cylinders and drums	31,710	2,718	2,385	327	37,140	22.5	29,926	21.2
Total	54,130	52,768	56,050	2,253	165,201	100.0	*141,400	100.0
Regional distribution:								
Pacific Coast area	6,983	8,072	20,083	...	35,138	21.3	29,796	21.1
All other areas	47,147	44,696	35,967	2,253	130,063	78.7	*111,602	78.9
Total	54,130	52,768	56,050	2,253	165,201	100.0	*141,400	100.0

* Revised figures.

Breakdown of liquid petroleum gas sales and uses.

gas supply will afford an important element of protection in the national defense. Gas manufacturing or distributing centers are particularly vulnerable to damage by sabotage or aerial bombing. The installation of L.P.G. standby plants at the vital points of use will distribute this risk, making it impossible for a single act of destruction to shut down more than the one unit which is directly affected.

Recently another application for standby plants, that of supplying a factory with gas during peak gas load periods, has begun to develop. Most natural gas systems allow substantial reductions in industrial gas rates if the customer will accept service which may be cut off on notice during heavy load periods.

By installing an L.P.G. standby unit which is adequate to carry over such periods, the factory owner can take advantage of the minimum rates for his normal gas service without having to interrupt his operation. In most cases the vapor is mixed with air or inert gas in order to produce a fuel which behaves more like natural gas than does the straight undiluted vapor. Such mixing is required in the colder parts of the country in order to prevent condensation in the lines, but in the warmer localities, unmixed vapor is used successfully.

The town-plant idea is obviously applicable to permanent or semi-permanent military establishments, such as isolated coast defense batteries and air service fields. The one fuel can be used to supply heat for cooking, water heating, space heating and even lighting. It can also be used to fuel electric generating sets, water pumping units, and other powers as required.

Still another modification of the town-plant idea is the use of L.P.G. at artificial gas plants to enrich or "sweeten" the artificial gas.

(2) Internal Combustion Engine Fuel

Use as internal combustion engine fuel permits liquefied petroleum gas to display its unique valuable properties to the utmost. Several of its applications to burning service are extremely valuable, but in practically every case other liquid fuels could be substituted at some additional inconvenience and expense. As applied to internal combustion engines, and particularly to automotive machines, L.P.G. possesses several absolutely distinctive advantages over all other liquid fuels.

These advantages arise from three peculiarities of the fuel as applied to engines:

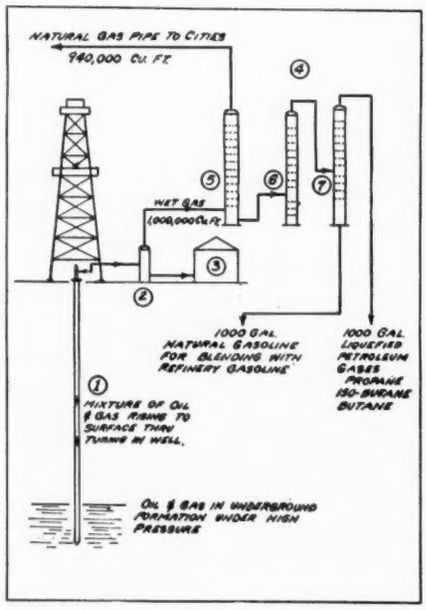
First, since it is prevaporized and fed to the cylinders as an absolutely dry mixture of vapor and air, no lubricating oil dilution can occur.

Second, for the same reason, the charge burns cleanly and completely.

Third, the fuel shows an effective octane number of 100 to 115, which gives remarkably smooth operation and reduces structural strains in the engine parts.

We will discuss these points in some detail, to see what they mean in the practical operation of engines.

Shortly after making the first serious conversions of heavy equipment in 1933, many operators began to notice that their engines ran much longer between overhauls than they had when fueled with gasoline. In several cases of extremely heavy equipment running at maximum load almost continuously, the service period between repair jobs was more than doubled.



Greatly simplified flow sheet illustrating process of separating various components of natural gas to obtain commodities under discussion.

For instance, one of the earliest operators to convert heavy trucks to L.P.G. found that the interval between engine overhauls was increased from about 50,000 miles to over 115,000, and that after this increased period of service the engines were in better shape generally than they had been after the shorter period running on gasoline. Based on the accumulated experience gained from many thousands of conversions during the past seven years, it is conservative to say that the service period between overhauls is increased by 50 per cent. or in other words, the repair expense is reduced by one-third. There are definite records of many conversions where the improvement has been much greater.

Although all three of the special qualities of L.P.G. engine fuel undoubtedly contribute to this result, it seems clear that the most direct reason for the improvement in engine life lies in the absence of crankcase oil dilution. All ordinary gasolines contain materials which boil at temperatures of 400° F. or over. These high boiling "heavy ends" are seldom if ever actually vaporized in the charge entering a cylinder, but rather are in the form of a fine spray suspended in the air. This spray has the natural tendency to deposit on the comparatively cool cylinder wall, where it mixes with and dilutes the film of lubricating oil on the wall. During the next stroke the diluted oil film is swept off and down into the crankcase; thus the entire charge of oil is gradually diluted and contaminated with the non-lubricating heavy ends of the gasoline, destroying the lubricating quality of the oil.

With L.P.G. fuel the effect of operation on the lubricating oil is exactly the opposite of this. The heaviest material in L.P.G., normal butane, boils at 33° F., consequently the carburetion equipment has no difficulty in vaporizing the charge into an absolutely dry mixture. As a result, the lubricating oil never shows any trace of dilution, but actually increases its viscosity slowly due to the distillation of the lighter parts of the oil out of the cylinder film. Operators are accustomed to compensating for this effect by using a lighter grade of oil for make-up.

The absence of oil dilution permits the oil to maintain its original lubricating qualities, and thus affords the engine maximum protection from wear. As a corollary, the useful life of the oil itself is very greatly extended. Operators who change oil according to physical tests, and not because they think it has run long enough, find that intervals between changes can be tripled or better, and still the average condition of the oil will be much better than with gasoline fuel.

Clean burning of the fuel charge helps

promote long engine life indirectly, since the products of combustion consist only of water vapor and carbon dioxide, with only a trace of monoxide if the carburetor is properly adjusted. Thus there are no intermediate partially burned and cracked products to form gummy carbon deposits on rings and valves. One other minor advantage of L.P.G. in this connection lies in the fact that the commercial grades are almost or totally free from sulfur compounds, whereas sulfur is present in appreciable amounts in practically all motor gasolines. On burning, the sulfur forms oxides which combine with water to form actively corrosive acids.

One of the results of clean burning is the absence of disagreeable odor in the exhaust gases. This advantage is of real importance in connection with passenger buses, particularly in congested traffic where more or less exhaust gas works into the passenger compartment in spite of all precautions. Not only is the exhaust gas free from offensive smell, but carbon monoxide is practically absent, so that there is much less chance that the exhaust will affect sensitive passengers.

In one of the first passenger bus experiments a single bus was converted to L.P.G. out of a large fleet. After a few weeks the operator noticed that this particular bus, which was on short interurban service, turned in more fares than any of the other outwardly identical buses on the same run. The operating company received several letters from habitual riders on the line, asking what had been done to that bus to eliminate fumes, and why the rest of the buses could not be fixed up the same way.

The high octane number of L.P.G. fuel makes for smooth, flexible operation, and eliminates excessive explosion pressure strains in the engine. It is felt that this factor contributes appreciably to the reduction of engine maintenance costs. This property permits "lugging" grades a gear or two higher than is customary with gasoline fuel, resulting in substantial savings in running time.

Conversions of ordinary gasoline automotive equipment to use L.P.G. fuel are simple and cheap. A pressure fuel tank and special vaporizer and carburetor unit are all that is necessary, although it is usually advisable to increase the engine compression ratio in order to realize maximum economy. Combination carburetor units are available for normal operation on L.P.G., which permit running on gasoline in emergencies.

In spite of the fact that a gallon of average L.P.G. mixture represents only about 80 per cent. as much actual fuel value as a gallon of average gasoline, under usual conditions the L.P.G. will deliver gallon for gallon about the same duty when used as automotive fuel. The greater thermal efficiency of the L.P.G. is due primarily to the clean and complete burning and to the high octane rating which permits the use of higher compression ratios. Incidentally this improved efficiency causes the engine to run cooler under a given load; consequently in the average case a given engine will deliver more power with an equal degree of heating. In many instances careful tests have shown an increase of available power output of about 20 per cent. over that obtainable from the same engine when fueled with gasoline.

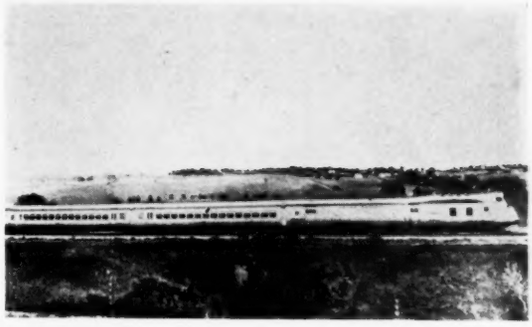
To sum up: the use of L.P.G. as domestic automotive fuel, releasing equivalent volumes of gasoline for direct war use, represents perhaps its most effective outlet in the national defense, for the following reasons:

It speeds up the operation of equipment.

It reduces material and labor required for maintenance.

It sharply decreases lubricating oil consumption.

Some figures on the present scale of the application of L.P.G. to internal combustion engines are interesting.



Union Pacific streamliner "City of Salina" uses liquid petroleum gas as fuel.

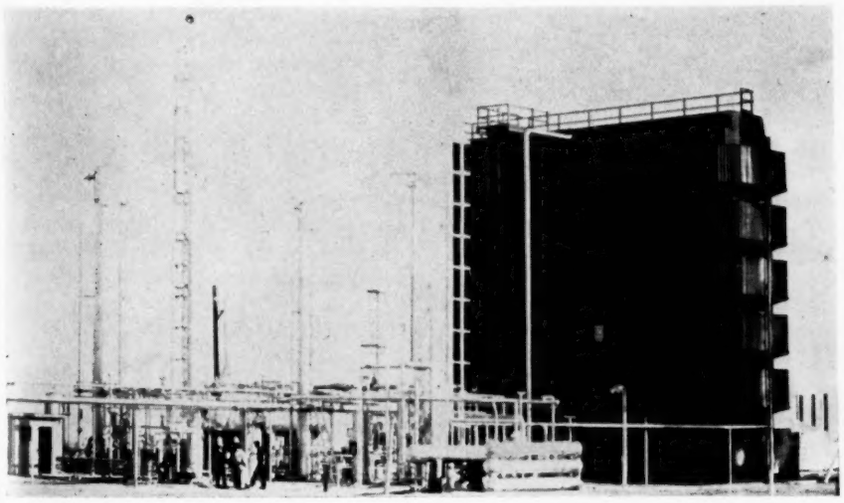
Data just released by the Bureau of Mines show that during 1939 total L.P.G. sales in the State of California amounted to 48,497,000 gallons, of which 24,048,000 gallons, or practically 50 per cent., was used for internal combustion engine fuel. Thus while the country-wide average is only 12.6 per cent. it is nearly four times as much here. The reason for this seems to be simply that the development of automotive use happened to get started on the Coast, perhaps due to the fact that we use heavy truck transportation more here than elsewhere.

Estimates based on data from carburetor manufacturers and others indicate that there are at least 15,000 applications of L.P.G. fuel to internal combustion engines. Of this number, certainly not less than 80 per cent., and possibly 90 per cent., are on automotive equipment. Data on current sales of equipment indicate a present rate of probably 400 conversions a month.

Experience with L.P.G. as automotive fuel on a practical scale goes back to about the middle of 1933. An infinity of details of carburetor equipment, fuel tank design, fittings, pumping, metering and dispensing systems had to be worked out before the applications could be called commercially successful. Along with this development, it was necessary to cooperate with the safety and fire prevention regulatory bodies, so as to establish reasonable standards of safe practice. By 1935 most of the details of physical equipment had been worked out, and a safety code was established by the National Fire Protection Association and The California Industrial Accident Commission which has had a thorough testing by experience since then. The record of safety for this type of use shows that both the equipment and the regulations are adequate for all practical requirements.

Internal combustion engine use of L.P.G. includes every imaginable type of application. Automotive use includes, in the approximate order of the numbers of the applications, farm tractors, trucks, harvesting and other special agricultural machinery, special dirt moving equipment,

Absorption plant recently completed on Pacific Coast.



road building machinery, semi-portable oil and water well drilling equipment, and even a small number of private automobiles.

Among the earliest automotive applications were several rail motor coaches of the Southern Pacific Company. Railroad use was extended last year to include the "City of Salina" Streamliner on the Union Pacific System in Kansas, as well as the conversion of several rail motor coaches. In these applications the greatly increased power output from the engines was a real factor in increasing payload and making possible improved schedules.

Stationary engine use includes well pumping for irrigation, electric generator units, air compressors, mine hoists and in fact about everything which is operated by a gas or gasoline engine.

The use of L.P.G. for "wearing in" engines after assembly, is becoming increasingly popular. It has several obvious advantages for this work, such as absolute cleanliness, ease of connecting up and disconnecting, and elimination to a large extent of fire hazard around the testing stand. One peculiar advantage lies in the fact that the fuel is free from sulfur or any other material which might leave a corrosive residue on the engine parts; hence it is not necessary to go to elaborate lengths to clean out the engine after the run-in. This point has particular value in connection with wearing-in airplane motors.

(3) Use as Raw Material for Chemical Conversion

Polymerization: It was discovered about 8 years ago that butanes, and even propane to some extent, could be partly converted into heavier fuels in the gasoline range by subjecting them to the proper amount of heat and pressure. In the process, a large proportion, ranging from 40 per cent. to 65 per cent., of the original L.P.G. charged into the plant is degraded into fixed gases. At the time these processes were developed, the L.P.G. charge stock was looked on as a waste product, hence any use which conserved part of it was beneficial provided the operation would pay. However, if the mixed propane-butane charge stock has a value even as low as about 2c per gallon for use as L.P.G., most polymerization operations would not pay.

The "poly" gasoline produced by these processes has a high effective octane number for blending; consequently war requirements might change this economic picture somewhat. Nevertheless, the conversion of propane itself is so inefficient in any present polymerization process, that it would not be used for charge stock if it had any value at all for direct fuel use.

As far as we know, only one "poly" unit has ever been built to operate exclusively on iso- and normal butane derived from a natural gasoline plant. At last reports, this plant was processing about 1200 barrels per day of pure butanes unmixed with propane. The plant is in a location where probably it would be impossible to develop a direct market for such a large amount of butane, hence the charge stock has little or no alternative value. Our information regarding this operation indicates that it is only moderately profitable.

On the basis of present knowledge it seems unlikely that the practice of polymerizing butane will expand greatly. It seems probable that such operations of this type as are now in existence would be converted to other types of cracking if the L.P.G. charge stock should, through increased direct use, develop a market value bearing some reasonable relation to its intrinsic merit.

New Conversion Method

Alkylation: Recently several schemes have been developed whereby iso-butane can be converted by a comparatively simple and inexpensive process into iso-octane. This material has an octane number of 100, and has great value as an ingredient of fighting grade aviation gasoline. Subject to the limitations imposed by the cost of fractionating the iso-butane and gathering it from its scattered sources into a central alkylation plant of reasonable size, this use of iso-butane would probably take precedence over all others in the national defense fuel economy.

However, such diversion of iso-butane will have no serious effect on the development of the direct use of L.P.G. for a long time, since it is estimated that iso-butane constitutes not more than 20 per cent. of the volume of present commercial L.P.G. materials. As will be shown, the present total utilization consumes about 20 per cent. of the readily available supply of L.P.G. materials, so that the diverted iso-butane can be replaced easily.

Synthetic Rubber: Within the past few months have been announced by the Goodrich Tire and Rubber Co. and Standard Oil of New Jersey, two different processes for the manufacture of synthetic rubber from petroleum as a raw material. The immediate product which serves as the starting point for the synthesis is a hydrocarbon called butadiene, a sort of first cousin to butane. Butadiene can be made by cracking crude oil or distillates; it can also be made by removing some hydrogen from butane.

As far as we can determine from the published material, the production of the butadiene by cracking is probably cheaper than making it from butane, particularly if the butane has a reasonable value for direct use. At present it is impossible to judge how far this development may affect the utilization of butane for fuel purposes. But even if all the available butane were absorbed for the manufacture of rubber, the same operations required for the extraction of the butane will yield large amounts of propane. Nothing that has been said in this whole discussion about the uses of L.P.G. is limited to either propane or butane or any particular mixture of them, and there is plenty of room for very great further expansion of L.P.G. utilization even if all the butane were used for other purposes.

An attempt has been made to estimate the economically available supply of L.P.G. Starting with the statement in a recent A.P.I. report on natural gas that the total wet gas processed by natural gasoline plants is currently 5,600,000,000 cubic feet per day, we then have to estimate the average available L.P.G. (propane and butanes) content of this gas in excess of the butane absorbed by the natural gasoline production. We have estimated that this excess content averages 1 gallon per thousand cubic feet, and that the average gasoline plant can capture half this amount with a reasonable outlay for L.P.G. equipment.

On this basis, the readily available supply is 2,800,000 gallons per day, or just over a billion gallons a year. This is nearly 5 per cent. of last year's total consumption of gasoline in the United States; it is also over six times last year's consumption of aviation gasoline.

The best present estimate of total L.P.G. consumption for 1939 is 227,000,000 gallons; thus the industry has plenty of room to grow, and still take care of all existing fields of use.

Conclusions

Liquefied petroleum gas has an important place in the national fuel economy, whether under war conditions or not.

In case of war, the following special applications arranged in their order of potential consumption seem to offer the greatest promise of valuable service:

As a domestic substitute automotive fuel, releasing gasoline for military use.

For essential industrial operations, and as standby to protect such industries against failure of normal fuel.

As a general utility fuel for isolated military bases.

There is nothing in the present statistical position of the industry to interfere with the further orderly development of the ordinary fields of use as domestic fuel, for gas manufacturing, and in industry.

An interesting possibility of military value, on which practically no work has been done, lies in the direct application of L.P.G. to fuelling aeroplanes.

Finally, the liquefied petroleum gas industry has developed and proved the tools and methods for using a most valuable addition to the list of fuels, and stands ready to devote all its effort and experience to the national defense.

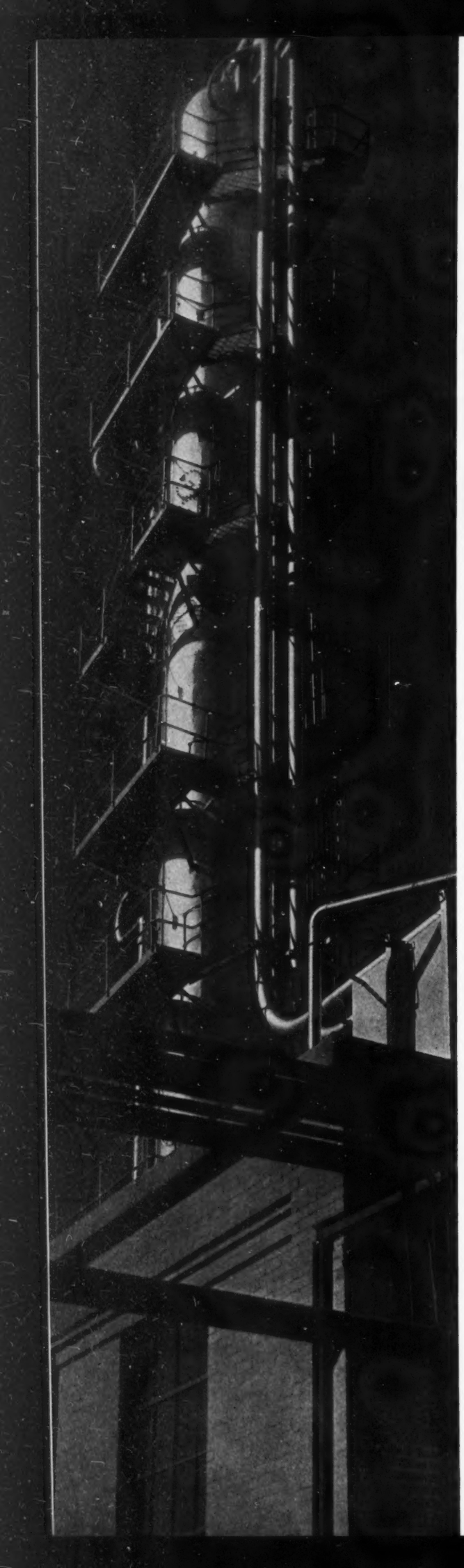
CHEMICAL SPECIALTIES

SHEAFFER'S Para-Lastik
FOR PASTING PAPER OR OTHER FLEXIBLE MATERIALS
NO CURL OR WRINKLE—MAY ALSO BE USED LIKE RUBBER CEMENT
SHEAFFER'S Para-Lastik
FOR PASTING PAPER OR OTHER FLEXIBLE MATERIALS
NO CURL OR WRINKLE—MAY ALSO BE USED LIKE RUBBER CEMENT
SHEAFFER'S Para-Lastik
SHEAFFER'S Para-Lastik

Sheaffer's Para-Lastik, product of Sheaffer's, Madison, Wisc., boasts of an ingenious package. A small brush is set into the top of the tube which is used as an applicator. When the tube is used for the first time, the cap must be screwed tight, which releases the contents. Thereafter, the brush may be moistened by squeezing the tube.

INDUSTRIAL • HOUSEHOLD • AGRICULTURAL

CHEMICAL INDUSTRIES



NAPHTHENIC ACIDS
In Specialty Formulas

While Naphthenic Acids Derived From Petroleum Sludges Have Not As Yet Been Completely Isolated and Identified, Their Uses In Soaps, Paints, Fungicides Are Many and Varied.

IN the refining of crude petroleum oils, by treatment with sulfuric acid and subsequent neutralization with caustic soda, sludges are formed. Such products, more or less purified, are variously known as mahogany sulfonates, petroleum sulfonates, naphthenic soaps, and naphthenic acid sludge.

The appellation "naphthenic soaps" as applied to such products is not strictly true, and may be misleading, because they are really sodium hydrocarbon sulfonates, for which one refiner gives the empirical formula $C_{22}H_{28}SO_3Na$, having a molecular weight of 440. Another refiner, having purified the sulfonates, offers a product in flake and powder form, to be used as a wetting agent.

The term, naphthenic acids, is used to describe cyclic carboxylic acids occurring in petroleum. Although these acids have been the subject of extensive research, both here and abroad, it is problematical whether they have as yet been entirely isolated and identified. However, we do know that crudes which are rich in paraffin (Pennsylvania crudes) have low naphthenic acid content, about 0.1 per cent., and conversely, those crudes (Russian, Rumanian, Venezuelan and California) which are poor in paraffin, contain considerably more (1 per cent. to 3 per cent.) naphthenic acids.

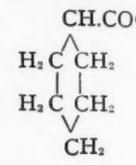
An idea of the potential supply of naphthenic acids may be gleaned as follows: Based on a yearly world wide production of 200 million tons of petroleum, and an average of 0.1 per cent. content of naphthenic acids (which is low), there is available for recovery, 200,000 tons of acids. Actual production figures are not available, but V. L. Shipp, *Oil and Gas Journal*, March 19, 1936, estimates the Russian production as follows:

1912	4,000,000	pounds
1928	12,000,000	"
1934	35,000,000	"

The U. S. Tariff Commission reports that in 1936, 514,014 pounds valued at $26,440, arrived at the port of New York, principally from Hungary and Rumania.

In the United States the greater part of the naphthenic acids used, are converted into metallic naphthenates, for use as paint driers. In many European countries, where fats are scarce, these acids are used to a certain extent in the manufacture of soap.

The acids include the aliphatic acids of the general formula $C_nH_{2n}O_2$, the $C_nH_{2n-2}O_2$ type, and the bicyclic acids $C_nH_{2n-4}O_2$ and G. E. Goheen found acids containing 5 carbon rings and a molecular weight of 317. Merck's Index gives this graphic formula for naphthenic acid (hexahydro benzoic) or cyclohexane carboxylic acid), which has a molecular weight of 128.09. It further describes the acid as consisting of transparent tablets or prisms; odorless, but when fused, has a valerian odor. Sp. Gr. 1.034, melts 30-31° C. Boils 23° C. Slightly soluble in water, very freely in alcohol, chloroform, ether and petroleum benzine.



The lower members are colorless liquids when pure, the higher ones are yellowish. They are also soluble in liquid SO_2 but the solubility decreases as the molecular weight increases. They boil from 120° C. at 12 mm. pressure, to 300° C. under 0.1 mm. for the highest components. Acids derived from Gulf coast petroleum have a molecular weight of 220–240 and correspond to 14–29 carbon atoms per molecule.

These acids form normal salts as do other acids.

The crude oil, or distilled fractions thereof, are stirred with concentrated sulfuric acid (0.5 to 1 per cent.) for benzine, 2-4 per cent. for kerosene and 5 to 10 per cent. for lubricating oil. Upon settling, the lower layer which consists of acid tar, is thrown off and the oily layer is stirred mechanically or with air, with 2 to 5 per cent. caustic soda. The acids together with some sulfonic acids formed by the sulfuric acid go into the alkaline layer, which is allowed to precipitate and is later separated. The impurities are due chiefly to the soap being contaminated with the hydrocarbons from the petroleum. The lye is then evaporated down, salted out with sodium chloride, and the residue is worked up to sodium soaps of

By

Benjamin Levitt, F.A.I.C.

Consulting Chemist

naphthenic acids. The soaps may then be cut with dilute sulfuric acid to isolate the naphthenic acids. These are dark, and of commercial quality.

By a newer method of recovery, U. S. 1,681,657, in which selective solvents and absorbent earths are used, acid tar formation is minimized, and only the alkaline treatment is necessary. The naphthenic acids are obtained by stirring with sodium carbonate, adding alcohol and drawing off the alcoholic extract, and then distilling off the alcohol. Such soap solutions can be freed of oil by evaporation or vacuum distillation. Sulfur dioxide is used in place of sulfuric acid to liberate the naphthenic acids from the soap. Then the alkali can be regenerated from the sodium sulfite with quicklime.

To obtain pure naphthenic acids the method of Spitz and Honig may be used. In this process, the impure acids are esterified with methyl alcohol, and the mixture of esters washed with alkali and distilled. The distillate is then saponified with caustic soda and extracted repeatedly with petroleum ether. The process is then repeated. Even this does not always remove the last traces of impurities.

Physiological Properties

Naphthenic acids have an unpleasant odor, and even when purified, and allowed to stand, the original odor returns. Krupzis ascertained that the acids are poisonous to fish, frogs and crabs, but less toxic to dogs and human beings. Cats are affected to a greater extent. The acids possess powerful bactericidal properties, as do their metallic salts.

Although some investigators have found that naphthenic acid soaps do not lower the interfacial tension between oil and water as much as do the palmitates, nevertheless the naphthenates are more effective in producing oil in water emulsions. Naphthenic soaps have a higher solvent power for hydrocarbons and give less foam than the palmitates.

Minich and Lewison found that sodium, potassium and triethanolamine soaps prepared from purified naphthenic acids are appreciably less alkaline in reaction than other soaps. Their aqueous solutions even in high concentration do not jel. They are excellent emulsifying and strong wetting out agents, and good detergents. They do not salt out readily. They possess marked germicidal and fungicidal value. They do not oxidize readily and consequently will not develop rancidity. Equal parts of carbon tetrachloride, cyclohexanol and sodium naphthenate make a good dry cleaner's soap.

A reaction between sodium naphthenate and alumina is employed for sizing cardboard. By polymerization, the aluminum naphthenate formed hardens to an undetachable elastic film.

Ammonium, sodium, potassium and lithium salts are readily soluble in water. Magnesium, calcium and barium salts are more sparingly soluble.

A solution of calcium naphthenate in oil increases its viscosity, and this property is sometimes made use of in lubricating oil. Calcium naphthenate is used as a catalyst in the production of fatty acids, in catalytic oxidation of petroleum.

The aluminum and heavy metal salts are insoluble in water and alcohol, and can, therefore, be obtained by precipitation with the salts of the metal concerned, fom alkali naphthenate solutions.

Aluminum naphthenate may be used as a delustering agent for rayon. It will produce paint with any desired flatness, higher solid content, lower penetration and easier brushing. A viscous liquid is formed by dissolving 10 per cent. of aluminum naphthenate in solvents.

U. S. 2,186,750 describes an alkaline aluminum naphthenate, or naphthenic ester dispersion, insoluble in water, and a stable waterproofing dispersion of rubber, for impregnation of jute fabrics, to waterproof and to proof against deterioration by fungi and molds.

Manganese salts are pink, ferrous salts, green; ferric salts, reddish brown; chromium salts, violet and green; and copper salts are also green.

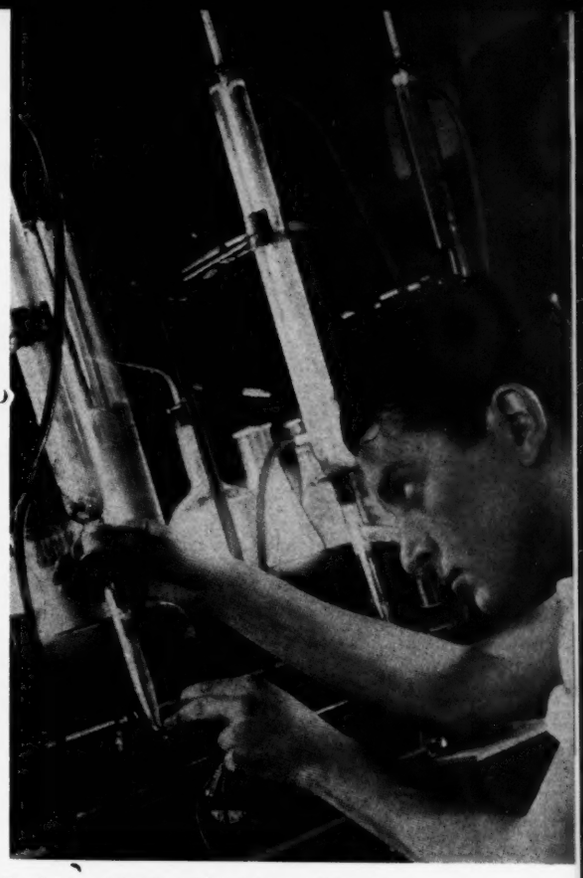
Manganese, cobalt and lead driers are produced from vacuum distilled acids, by methods of precipitation and fusion. These salts are also used for insulating materials, adhesives, and varnish substitutes. Lead oleonaphthenate is used in non-chatter oils. Tin naphthenate, according to British patent 398,222, is used in non-sludging motor oils.

Because of their insecticidal properties, the copper salts are used to impregnate wood, against attack by termites, and for preserving jute bags, canvas tents, fishing nets and ships' bottoms. Copper naphthenate is soluble in naphtha, toluol, turpentine and other organic solvents.

A 20 per cent. solution of copper naphthenate in petroleum spirits is recommended for treatment of wood against dry rot. Copper naphthenate makes a good anti-wrinkling agent for synthetic enamel. It improves gloss and adhesion. It is a good anti-skinning agent when used to the extent of 0.03 to 0.3 per cent.

Cerium naphthenate is an excellent drier, but because of its change of color with change in valency, it cannot be used in white paint. It is used chiefly in high grade varnish. It is used also as a waterproofing for impregnation of rope and sails. In printing ink, cerium naphthenate prevents too great absorption of the ink by the paper. It produces stronger films than those of lead, cobalt and manganese. Zinc naphthenate imparts thixotropic properties to paint. It facilitates grinding and dispersion.

Zirconium naphthenate is formed by heating mixtures of naphthenic acid with zirconium sulfate. It is an amber colored, transparent heavy liquid, with a consistency of heavy lubricating oil. It possesses no drying quality, but may be used as an anti-chalking agent and also as an ingredient of pottery glaze and enamels.



Testing naphthenic acid in Stanco laboratory.

Glycerol esters of naphthenic acids are used in the manufacture of lacquer and wetting agents.

When naphthenic acid anhydride or its esters are subjected to catalytic hydrogenation at 10 atmospheres pressure and above 200° C. naphthenyl alcohol is produced. Treatment of the alcohols of the higher molecular weights with sulfuric acid or chlorosulfonic acid leads to the formation of sulfonic acids which have detergent properties. Substitution of OH by halogens produces halides, which may be used as a basis for further synthesis.

Naphthenic resin, according to French patent 827,203, is produced by esterifying 1 mole of naphthenic acid with 1 mole of glycerine and 2 OH groups are caused to react with maleic, adipic, succinic, phthalic or other dibasic acid. Harder resin may be produced with maleic acid anhydride and less naphthenic acid.

When a mixture of octyloxyacetic and naphthenic acids are treated with manganese chloride and sodium acetate in the presence of toluene, a manganese complex in the form of a yellow resin is formed.

The writer wishes to thank Dr. T. G. Delbridge, Atlantic Refining Co.; Dr. Erich Meyer, L. Sonneborn Sons, and Dr. Arthur J. Franks, Sherwood Petroleum Co. for their letters, which were of considerable assistance in the preparation of this article.

ADVERTISING PAGES REMOVED

CHEMICAL SPECIALTY *News!*

American Asphalt Paint Merges With Marietta Paint—A.S.T.M. Considers New Soap Specifications—New Insecticide Standards Ready.

AMERICAN Asphalt Paint Co., Chicago, and The Marietta Paint and Color Co., have been merged as the American-Marietta Company. The Marietta Company formerly operated as a subsidiary of American Asphalt.

Grover M. Hermann, founder and president of American Asphalt has been named president of the new company. Under his direction, the former parent company became one of the leading manufacturers of heavy-duty industrial maintenance paints under the trade name "Valdura."

George A. LaVallee, former president of Marietta Paint, continues as director of the American Marietta Company.

Four plants are operated by the company at Kankakee, Ill., Marietta, Ohio, High Point, N. C., and Lincoln, N. J. Sales of the two companies for the seven months ending June 30, show a gain of nearly 20 per cent. over the same period last year. Facilities of the Kankakee plant have been doubled during the past year, and expansion program at Marietta is now being carried out.

A.S.T.M. Acts on Standards

American Society of Testing Materials, at its Atlantic City convention, approved four new tentative specifications covering olive oil, solid soap, salt-water soap, tetrasodium pyrophosphate (anhydrous), sodium sesquisilicate.

The olive oil specification covers soap in solid form suitable for textile and other purposes, both pure and blended. Salt water soap specification covers soap for use in salt water.

Scope of tetrasodium pyrophosphate (anhydrous) specifications indicates that it covers material suitable for various washing, cleaning, and scouring processes with soap or other detergents where a mildly alkaline material with appreciable water softening properties, is desired.

The specifications for sodium sequisilicate pertain to materials suitable for various washing, cleaning, and scouring processes with or without soap as conditions demand, and where a strongly alkaline material is desired.

New officers are: chairman, H. P. Trevithick, N. Y., Produce Exchange; vice-chairman, F. W. Smither, National Bureau of Standards; secretary, B. S. Van Zile, Colgate-Palmolive-Peet.

Pest Control Convention

National Pest Control Association will convene in Claypool Hotel, Indianapolis, Oct. 28-30, with president Walter S. McCloud in the chair. Lawrence A. McKenna is general chairman, and Ed A. Arnott local chairman.

Highlight of the banquet on Oct. 30, will be an address by Edward C. Elliott, Purdue president, who appears at the Pest Control Operators Conferences which are held at Purdue.

Nuodex Plant Dedicated

New plant of Nuodex Products Co., Inc., at 830 Magnolia Avenue, Elizabeth, N. J., said to be the largest of its kind in the world devoted exclusively to the production of driers for the paint, varnish and ink industries, was dedicated July 26, with city officials, business and industrial leaders, and company officers attending.

"Zelan" Sales Tripled

Sales of "Zelan," DuPont repellant finish have tripled during past six months, company reports. Chief users are makers of rainwear and sports clothes.

Stern Chemical Incorporates

Stern Chemical Corp., 819 Swan st., Terre Haute., has been incorporated to manufacture oil, waxes, soaps, chemicals and other supplies.

Superior Buys Plant

Superior Chemical Products has purchased the building at 819 Himrod av., Youngstown, O. The structure, an old temple building, was almost completely destroyed by fire and rebuilt by Superior.

Taylor-Ragan Formed

Taylor-Ragan Co., has been formed at Ellerbe, N. C., for manufacture of White Arrow cleaner. Gilbert Ragan is president, L. A. Taylor, vice-president, Mrs. Nicholas Dockery, secretary-treasurer.

Casein Plant Opens

Casein Pigment, Inc., has leased a building located between Hudson st. and the railroad, to manufacture casein paints. Charles R. Lyons is president.

New Solventol Product

Solventol Laundry Concentrate, a new household washing compound, has been introduced by Solventol Chemical Products, Inc., Detroit.

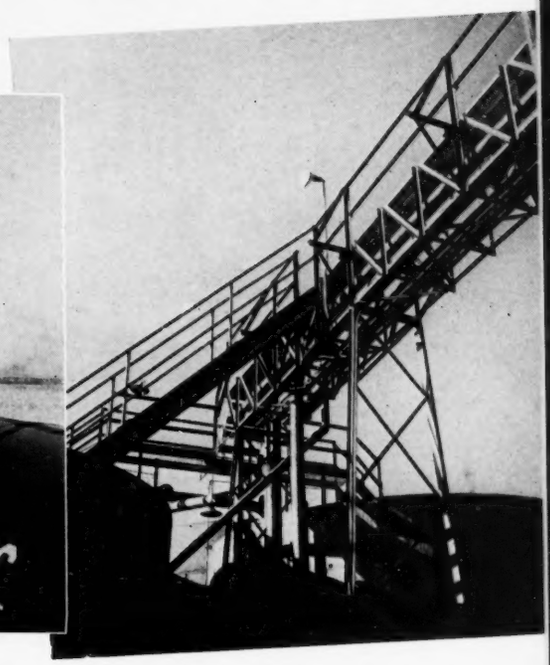
White-Sun Products, Kansas City, is marketing its "15 & 1" Liquid Cleaning Wax in five sizes of glass containers and 5 gallon cans. Product takes name from the fact that only one part of product added to 15 parts water makes a satisfactory solution. Owens-Illinois supplied containers.

Wishnick-Tumpeer Opens New Chicago Plant

Pioneer Asphalt plant and Witco research laboratory opening marks passing of twentieth business milestone by the company.

Dusk view of one of the large smoke stacks at new Witco chemical plant.

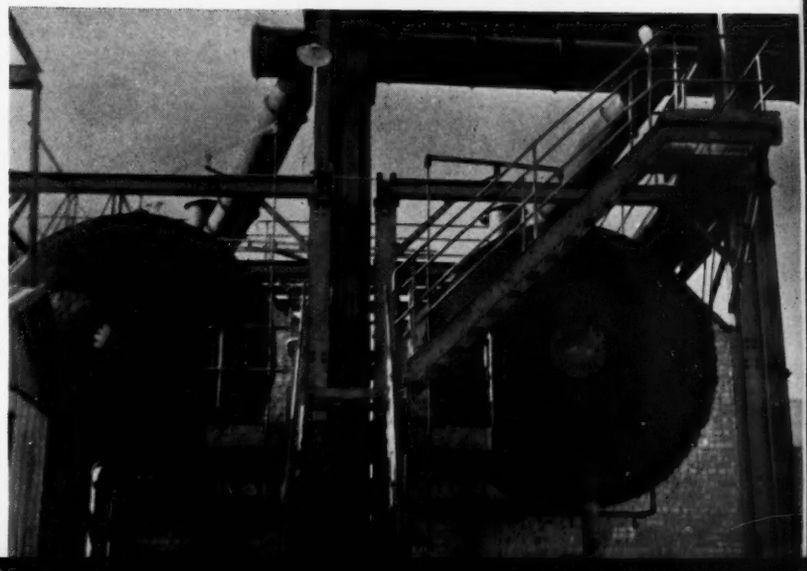
One of a fleet of insulated tank cars loaded for hot delivery. Company maintains fifty tank cars and many motorized tanks.



Walkway over numerous raw material storage tanks. Plant was laid out on twenty acres to permit future expansion.

A series of special fractionating towers are employed to break down what are known as "light ends."

Witco's new central laboratory building is equipped with most recent precision apparatus. Scene at right shows viscosimeter test.



Batteries of unusual size stills are utilized. They are heated by furnaces which burn as fuel, oils—some of which are an end product of asphalt manufacture.

Miss Minnie Kiel, receptionist, smiles a pleasant greeting to our editorial visitor who spent a day recently at Dow's Midland plant.

Pride and joy of sales division is this Ethocel tile construction which forms the north wall of the new offices.

No visitor is ever ill at ease when in the cheerful presence of Leland I. Doan, vice-president and general sales manager.

A DAY AT DOW

George D. Welles, Jr., is advertising manager and editor of *Dow Diamond*.

S. L. Starks director of technical employment and industrial relations eyes the visitor appraisingly.

Dr. Willard H. Dow, president and general manager.

Amos Ruddock of the advertising department is editor of *Spot News* and *Dowflakes*.

Genial W. A. Melching is a member of Dow's special products division.

S. W. Putnam, manager of special products sales, looks up to greet his visitor.

Don Williams, assistant general sales manager, takes time out for a pleasant chat.

W. F. Stumpfig looks after office details for Dow's General Sales Division.

SHARPLES SECONDARY AMINES

SHARPLES TRADE MARK SOLVENTS

	DIETHYL-AMINE †	DI-n-PROPYL-AMINE *	DI-ISOBUTYL-AMINE *	DI-n-BUTYL-AMINE †	DIAMYL-AMINE † (mixed isomers)	N-MONOAMYL ANILINE* (mixed isomers)	N-MONO-n-BUTYL ANILINE*
COLOR AND FORM	COLORLESS LIQUID	COLORLESS LIQUID	COLORLESS LIQUID	COLORLESS LIQUID	VERY LIGHT STRAW LIQUID	LIGHT STRAW LIQUID	LIGHT STRAW LIQUID
MINIMUM AMINE CONTENT	98%	97%	97%	98%	98%	95%	95%
MOLECULAR WEIGHT	73.1	101.1	129.2	129.2	157.2	163.1	149.1
SPECIFIC GRAVITY @ 20°	0.71	0.74	0.75	0.76	0.78	0.92	0.93
LBS. PER GALLON	5.90	6.18	6.22	6.33	6.45	7.64	7.71
DISTILLATION RANGE °C	53–59.5	105–109	136–140	153–172	175–218	245–260	234–242
FLASH POINT °F	0	45	85	135	158	225	225
REFRACTIVE INDEX @ 20°	1.3871	1.4063	1.4124	1.4186	1.4259	1.5285	1.5351
SOLUBILITY IN WATER	SOLUBLE	SOLUBLE	SLIGHTLY SOLUBLE	VERY SLIGHTLY SOLUBLE	VERY SLIGHTLY SOLUBLE	INSOLUBLE	ALMOST INSOLUBLE
SOLUBILITY IN ALCOHOL	SOLUBLE	SOLUBLE	SOLUBLE	SOLUBLE	SOLUBLE	SOLUBLE	SOLUBLE
SOLUBILITY IN PARAFFIN HYDROCARBONS	SOLUBLE	SOLUBLE	SOLUBLE	SOLUBLE	SOLUBLE	SOLUBLE	SOLUBLE

†COMMERCIAL PRODUCTS *SEMI-COMMERCIAL PRODUCTS

Sharples secondary amines are used in the manufacture of rubber vulcanization accelerators, flotation reagents, dyestuffs, polymerization and gum inhibitors and emulsifying agents. Send for Sharples Catalog of Synthetic Organic Chemicals describing more than 125 new compounds.

THE SHARPLES SOLVENTS CORPORATION

PHILADELPHIA • • CHICAGO • • NEW YORK

Commercial Movies On Chemical Subjects

The chemical industry has long been producing commercial motion pictures of a semi-educational character, largely for public showings, but also for showings in the trade itself and in those industries which it serves.

Du Pont has been a pioneer in the use of movies, while Union Carbide and National Carbon contributed their share. Du Pont has made some outstanding pictures including "The Wonder World of Chemistry," and "Cool Heads." Laboratory scenes from these are shown at the left.

The industry has made available to the educational field many motion pictures which have had wide circulation, not only in the trade but in schools and colleges, such as Liquid Air, Dry Ice, The Story of Sulfur, Beyond the Microscope, The Carbon Dioxide Cycle, Historical Introduction to the Study of Chemistry, Colloids, Oxidization and Reduction, Men and Oil, and many others.

Most recent of the commercial films to be introduced is that of Interchemical Corporation entitled: "More Than Meets the Eye." Stills from the picture, starting at lower left, and running down the right hand side of this page, illustrate scenes describing productions of inks and coatings, as well as their ultimate uses.

NEWS OF THE MONTH

GOVERNMENT

National Defense Program has pushed along at least two chemical projects which under normal conditions would not have matured quite so rapidly. One is commercial development of synthetic rubber, the other, recently announced production of toluol from petroleum.

B. F. Goodrich Co., which made news recently with public showing of first automobile tire made exclusively from synthetic rubber "Ameripol" steps into the spotlight again. Acting jointly with Frank Phillips, Phillips Petroleum board chairman, David M. Goodrich announced formation of Hydrocarbon Chemical & Rubber Company to produce synthetic rubber.

"The new organization brings together, for the purpose of immediately strengthening the nation's defense position with respect to vital rubber supplies, two major companies, each possessing a broad background of experience in research, production and use of hydrocarbon products. The close coordination between these two companies accomplished by the formation of Hydrocarbon Chemical and Rubber Company will hasten the day when, if necessary, every American tire as well as the thousands of other rubber products can be made wholly with American rubber," the statement said.

"Phillips Petroleum Company has a strong patent position in the processing of petroleum hydrocarbon and possesses immediate supplies and vast reserves of the raw materials used in the manufacture of synthetic rubber," it was pointed out. The Goodrich Company announced several weeks ago, on June 5th, the commercial production of the nation's first automobile tires made from synthetic rubber, after an intensive 14-year independent development program in its rubber research laboratories, which are the oldest in the country.

"In the formation of the new Hydrocarbon Chemical and Rubber Company, Goodrich and Phillips are combining their facilities for the manufacture of synthetic rubber. These are being rapidly expanded so that samples of materials and detailed technical information relating to military and industrial uses of the new substances may be put in the hands of prospective users," the statement said. Present production is being substantially increased. The new company's principal offices will be located in Akron, Ohio.

To speed output of synthetic rubber for national defense and industrial uses, David M. Goodrich (left), chairman, The B. F. Goodrich Co., and Frank Phillips, chairman, Phillips Petroleum Co., signed contracts for formation of Hydrocarbon Chemical and Rubber Company which will pool petroleum and processing facilities of the two major companies to make larger commercial quantities of synthetic rubber from petroleum-derived butadiene gas.

The directors of Hydrocarbon Chemical and Rubber Company representing Phillips Petroleum Company are Frank Phillips, chairman; K. S. Adams, president, and G. G. Oberfell, vice-president in charge of research. Representing the B. F. Goodrich Company are David M. Goodrich, chairman; John L. Collyer, president, and T. G. Graham, vice-president in charge of production, it was announced.

In charge of sales for the new concern will be Ross W. Thomas, who is general manager of the Philgas division of Phillips. Dr. Waldo L. Semon, who developed "Ameripol," will be director of research.

Toluol Developments

Direct instigation of Defense Commission has brought on high activity on production of toluol from petroleum. No fewer than three plants are now projected, with Commission prepared to ask for bids from contractors who can produce synthetic material within 12 months.

Bids will be received by Edward R. Stettinius, Jr., in charge of materials, at a central office in Wilmington.

Last month, process was announced by Universal Oil Products for synthetic toluol. Two plants are reported as in prospect for Chicago, one to produce 1,000,000 pounds yearly, with plans said to be well past the blueprint stage.

Latest entry into the field is Shell Oil which will begin immediate construction of a $500,000 plant at Houston, Tex., to produce 2,000,000 gallons a year. This site was chosen, according to the company, in order to take advantage of the huge oil resources of the Southwest. Plans were made for the plant as soon as process for production was perfected by Shell Development Company at Emeryville, Cal., laboratories.

COURTS

Concluding chapter in the Spring anti-monopoly investigation of major fertilizer companies at Winston-Salem, N. C., was written in Baltimore appeals court, when three judges dismissed an appeal seeking to enjoin government use of records obtained by subpoenas obtained at the original investigation.

Corporations appealing were Swift, and International Agricultural Corporation. They contended the government used "dragnet" subpoenas in obtaining the records, thereby violating the rights of corporations under the "search and seizure" provisions of U. S. Constitution.

Other six companies being investigated did not enter in the injunction appeal, except for arguing a motion in court on the issue. Meanwhile, all records involved are in Winston-Salem, being pored over by grand jury looking for signs of anti-trust law violations.

Gypsum Indictment

Special grand jury at Washington indicted five corporations and nine individuals on charges of fixing prices of

(*Continued on page 178, Col. 1*)

gypsum board, wallboard and lath through a patent licensing arrangement. Companies were: U. S. Gypsum, National Gypsum, Certain-Teed Products, Ebsary Gypsum, and Newark Plaster Company. Individuals named are officers and employees of the companies.

President Melvin H. Baker of National Gypsum denounced the indictment as "just another illustration of how business is being harassed by too much government interference." The licensing agreement in question, he declared, was fashioned after a decision of the U. S. Supreme Court.

GENERAL

All space available for the Exposition in connection with the Conference of the National Industrial Advertisers Association in Detroit, Sept. 18-20, has been reserved, according to Exposition Chairman Wilson Burden, of Witte & Burden, Detroit. The Conference, to be held at the Statler Hotel, is expected to bring representatives of more than 600 industrial concerns into sessions for three days devoted to problems and techniques in advertising and marketing the products which are used by other industries of the nation in their manufacturing processes.

The entire Exposition space in the Hotel Statler will be occupied by the following 26 concerns:

American Society for Metals & Metal Progress, Conover-Mast Corp., The Heinn Co., Simmons-Boardman Publishing Corp., Thomas Publishing Co., Graham Paper Co., Technical Publishing Co., Advertising Publications, Inc., The Iron Age, Detroit Tullar Envelope Co., Complete Service Publishing Co., Automotive Industries, The Industrial Press, Mac Rae's Blue Book Co., Tradepress Publishing Co., McGraw-Hill Publishing Co., The Burkhardt Co., Metal Industry Publishing Co., Nelson Associates, Inc., Latex Fiber Industries, Inc., Electric Refrigeration News, Amberg File & Index Co., Penton Publishing Co., Buchan Loose Leaf Records Co., Business Publishers International Corp., Iron & Steel Engineer.

Smokeless Powder Plant

Construction of a $30,000,000 plant in the Louisville, Ky., industrial area to produce smokeless powder was reported yesterday to have been agreed upon by the War Department and the Du Pont Powder Co. Under the agreement the government would build the factory and the Du Pont interests operate it. Start of construction awaited on final official approval.

The plant, first of four to be undertaken with emergency defense funds, is to have a daily capacity of 200,000 pounds, more than doubling the nation's entire existing output.

The projected plant, to be located on the Indiana side of the Ohio River, will be larger than a new privately-financed powder factory under construction at Memphis, Tenn., with a capacity of 150,000 pounds daily.

The Louisville plant will cost about $15,000,000, and an equal amount for machinery, it was estimated.

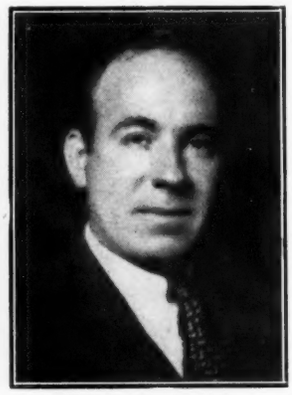
Cyanamid In Canada

Chemical Construction Company, division of American Cyanamid has started a $11,000,000 plant in Canada to produce chemicals used in manufacture of explosives for the British government. Location of plant is not known. Work on the main plant, which is being financed by the British government, will start shortly.

Salesmen's Golf

Winners at recent golf tournament of Salesmen's Association of the American Chemical Industry held at Canoe Brook Country Club were:

Low net, Class A, Charles Slater, J. T. Baker Chemical; Low net, Class B, Wm. J. Wood, Niagara Alkali; Members Kickers, Bart Sheehan, Graselli Chemical; Second low net Class A, Ira Vanderwater, R. W. Greeff & Co.; second low net, Class B, Al Leith; Members Kickers, Foster T. Smith, Merck; Guest low net, L. R. Shropshire, Bell Telephone; Guest Kickers, Walter Schappa, Du Pont; Member's low gross, W. D. Merrill, Joseph Turner & Co.; Member's Kickers, Larry French.



W. D. Merrill
Low Gross Winner

Next golf date is Aug. 20 at Bonnie Briar Club, Larchmont, N. Y.

General Vacation Plan

Gustavus J. Esselen, Inc., consulting chemists and chemical engineers, 857 Boylston St., Boston, will close its laboratories for a two weeks' vacation from August 19 to September 2. Its office will remain open during the vacation period for handling emergency matters. A similar "mass vacation" in 1939 proved so successful that it is being repeated this year. The advantage of this procedure, according to Dr. Esselen, is that summer let-down, usually distributed throughout the summer by staggering of vacations, is avoided.

Gustavus J. Esselen
Laboratory to Vacation

Nevada Manganese

Work will shortly be started on a chemical treatment and precipitation plant at the famous "Three Kids" manganese mines near Las Vegas, Nev. During the last war more than 10,000 tons of ore were shipped from the mines. While this project is understood to be privately financed, two U. S. Bureau of Mines engineers are now in Nevada examining prospective sites for manganese development and their possibilities.

Fertilizer Co-op Dividend

Southern States Co-operative is distributing $100,000 in dividend checks to farmers who availed themselves of the co-operative fertilizer service. Dividend represents savings of farmers by operation and use of their own fertilizer plants at Norfolk and Baltimore.

Aluminum Price Cut

Aluminum Company of America has made a price reduction of one cent a pound for aluminum. This is the second price change this year. On March 25 the company lowered its price for aluminum from 20 cents to 19 cents a pound. The latest reduction brings the price down to 18 cents.

Pacific Carbide Plant

Pacific Carbide & Alloys Company will erect a $250,000 calcium carbide and ferro-alloy manufacturing plant at Portland, Ore. The plant, which will be supplied with power by the Booneville Dam, will be the only one West of the Mississippi.

Sorrick Heads Lions

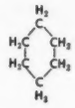
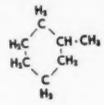
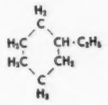
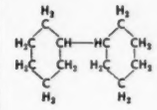
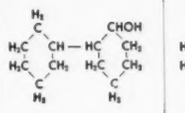
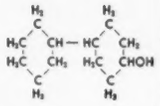
Karl M. Sorrick, president, Oxidermo Products, Springport, Mich., has been elected president, International Association of Lions Clubs, at Havana, Cuba.

DOW

8A

DOW SPECIAL PRODUCTS

This is the eighth of a series of advertisements announcing a list of products for which DOW has developed new processes of manufacture. The Dow Chemical Company invites inquiries from organizations interested in these products.

Product	CYCLOHEXANE Technical	METHYL CYCLOHEXANE, Technical	ETHYL CYCLOHEXANE, Technical	DICYCLOHEXYL	2-CYCLOHEXYL CYCLOHEXANOL	4-CYCLOHEXYL CYCLOHEXANOL
Formula						
Molecular Weight	84.2	98.1	112.2	166.3	182.3	182.3
Properties	Colorless liquid with a characteristic odor.	Colorless liquid with a characteristic odor.	Colorless liquid with a characteristic odor.	Colorless liquid with a characteristic odor.	Somewhat viscous colorless liquid with a mild pleasant odor. It consists of a mixture of the cis and trans isomers.	White crystalline solid with a mild pleasant odor. It consists of a mixture of the cis and trans isomers.
Boiling Range, 5-95%	80—81° C.	100—103° C.	130—134° C.	238—239° C.	151—156° C.*	161—172° C.*
Freezing Point	>0° C.	<—120° C.	<—20° C.	3° C.		76° C.
Specific Gravity at 25/25° C.	0.777	0.768	0.787	0.885	0.985	
Flash Point	<0° C.	—5° C.	35° C.	99° C.	132° C.	138° C.
Fire Point	<0° C.	—5° C.	35° C.	104° C.	141° C.	154° C.
Refractive Index at 25° C.	1.425	1.421	1.431	1.478	1.502	
Solubility						
at 25° C. in g./100 g. of solvent						
Acetone	∞	∞	∞	∞	∞	25
Benzene	∞	∞	∞	∞	∞	50
Carbon Tetrachloride	∞	∞	∞	∞	∞	26
Ether	∞	∞		∞	∞	64
Methanol	57	53	12	7	∞	200
Water	Insoluble	Insoluble	Insoluble	Insoluble	Insoluble	Insoluble

*At 20 mm. Hg

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY *include:* PHENOLS CAUSTIC SODA • ANILINE OIL • ORGANIC SOLVENTS • EPSOM SALT • SODIUM SULPHIDE • DOWTHERM

A complete catalog of Dow Industrial Chemicals will be furnished upon request.

THE DOW CHEMICAL COMPANY, MIDLAND, MICH.

Branch Sales Offices: New York City • St. Louis • Chicago • San Francisco Los Angeles • Seattle

Washington

Russell Kent

TO assert that the national defense program is lagging because of obstacles in the path of getting contracts signed is merely to assert an obvious truth. The assertion does not give aid and comfort to any potential enemy of the United States for the situation is well known to all except the general public of this country.

The fact is that there is a decided lack of cohesion among established agencies of the federal government in executing the program and there has been an emphasis upon appropriations and to some extent upon contracts signed with very little said about the time element involved in executing these contracts.

Russell Kent

There have been contradictory interpretations of the profit limitations written into the "speed-up" bills enacted in June and this factor has played a part in the delay.

The most serious obstacle confronting the long-range program is involved in the question of amortization of capital investment in plant facilities to be devoted to defense output. There has been a decided conflict regarding this between the Treasury Department and the National Defense Advisory Commission, with the White House upholding the position of the Treasury. Secretary Morgenthau has taken the adamant position that it will be necessary to have legislation to effectuate the objective of five-year amortization, which is the agreed term. President Roosevelt and the members of the Defense Commission were hopeful that with an agreement that the investment for facilities certified by the Secretary of War and Secretary of Navy as being essential for the national defense could be amortized over a five-year period, private industries would be willing to engage in contracts requiring heavy investment and depend upon subsequent Congressional legislative ratification of the agreement.

Developments rapidly showed, however, that managements were unwilling to risk the money of stockholders on any such basis owing to the fear of Congresional caprice. Thus, many vital contracts speedily reached an agreement stage but piled up on desks of officials awaiting signatures which would not be forthcoming until the amortization agreement was written into law.

The Defense Commission adopted a resolution urging that this subject be embodied in a joint resolution and put through Congress at an early date. However, on the same day, President Roosevelt at a press conference stated that inasmuch as the Treasury would lose some revenue by reason of the five-year amortization, this subject should be linked legislatively with the excess profits tax. Thereupon, the intent of members of the House Ways and Means Committee to introduce a joint resolution covering amortization only and enact it well in advance of the excess profits tax was short circuited.

Another bottleneck developed in Navy ship and Army and Navy aviation contracts through the sudden action of Congress just prior to the recess for the Republican National Convention in changing, with practically no debate or public notice, the profit limitations on airplanes and naval vessels. By a Senate amendment to the Navy speed-up bill, the profit on airplanes for the Army and Navy was reduced from 12 per cent. to 8 per cent. and the profit on Navy ships was cut from 10 per cent. to 8 per cent. on a competitive bid basis. The Navy had advertised for bids on 300 aircraft prior to enactment of this change and a preliminary notice of awards to a manufacturer was sent out. The manufacturer discovered that the sub-contractors upon whom he depended heavily for parts, were not interested with an 8 per cent. profit limitation. The Army found itself with negotiated contracts almost ready for signature involving 4,000 airplanes which it was necessary to destroy and to reopen negotiations.

The profit limitations of the Vinson-Trammell Act, the aircraft industry has complained, in reality do not permit the figures stated in the Act to be attained because of regulations by the Treasury Department which differ substantially from the regulations applying to income taxes. It was stated by the aircraft industry in a memorandum submitted to the Defense Commission that profits on Army and Navy planes ran more nearly three to four per cent. than to any higher figure, because of these regulations.

In the effort to overcome this bottleneck of profit limitations, the House Appropriations Committee inserted in the second supplemental defense appropriation bill a legislative rider removing from airplanes the limit of 8 per cent. made by the Vinson Act amendment and restored the 12 per cent. figure used in the Act of 1939. No effort was made in this bill to change the figure limiting profits on naval ship construction as such contracts cover a long period of time and it was thought any necessary change in that respect more properly should be made in a separate legislative bill.

There is every indication that Congress is going to enact an excess profits tax only after very careful consideration and with an opportunity for full presentation of the views of the taxpayers. The Treasury has recommended a basis which is a combination of invested capital and average earnings. Under this proposal, corporations will be granted an excess profits credit equal to a specific credit (which was $3,000 under the World War and post-War Excess Profits Act), plus the same percentage of invested capital for the taxable year that average income bore to invested capital in the selected pre-emergency years.

This formula appears complicated although accountants claim it is not. The fact is, however, that in the early days of private consideration of this proposal, with tax experts in the Treasury explaining it to the Democratic members of the Ways and Means and Finance Committees, the members of Congress were not particularly impressed with it. However, it may become the final form if industry in the testimony it is to present expresses satisfaction with it.

Defense Commission Influential

The National Defense Advisory Commission is wielding a major influence in Washington despite such stone walls as the Treasury's position on the question of amortizatioin. It is entirely probable, for example, that Congress would have refused to have appropriated money for additional power facilities for the Tennessee Valley Authority had it not been for the very firm support given this project by the Commission. The Senate passed the resolution without a roll call, appropriating $25,000,000 as the first increment of a $65,000,000 project for TVA, and

(*Continued on page 181, Col. 1*)

the House passed the same measure by a vote of 265 to 93.

Defense Commission members testified before the Appropriations Committees that additional power was needed in the TVA area because of expansion of defense plants there. There will be additional demand for energy by chemical plants, it was testified, but the main emphasis was placed upon the necessity for greater output of aluminum, of which commodity five tons enter the average military plane.

The enormous extent to which the United States government is rearming may be visualized by the appropriations and authorizations which have been made by the present Congress since January 1. It is to be remembered of course, that the appropriation of money does not automatically produce guns and tanks and chemicals and soldiers and sailors. But appropriation certainly are a pre-requisite of these essentials.

From the $252,000,000 neutrality enforcement special appropriation voted early in February, through the early part of August, Congress has appropriated for defense $8,174,914,000 in cash, plus contract authorizations aggregating $3,802,-034,000 for which future appropriations must be made. This makes a grand total of appropriations and authorizations of $11,976,948,000. Of this total, approximately $130,000,000 will be expended in civil activities such as the Civil Aeronautics Authority in its pilot training program, the Federal Bureau of Investigation and its sabotage and fifth column work, etc.

Chemical Warfare Appropriation

Of the total which has been provided, $37,689,437 has been appropriated in cash for the Chemical Warfare Service, to which should be added $17,436,910 in contract authorizations for the same branch of the Army. This does not include appropriations for plan expansion for chemical warfare.

The advisability of approaching intricate subjects only after careful preparation is demonstrated by the difficulties which have been encountered in obtaining licenses for the exports of chemicals and other commodities included in the so-called embargo proclaimed by the President in early July under the authority of the June Army speed-up bill.

The proclamation requiring licenses for the exports of specified commodities was made effective immediately upon its signature. There had been no preparation and a month later the licensing system was operating in practical effect as an embargo upon certain shipments. Questions of interpretation of the regulations were unanswered for days and in some cases weeks, so that collectors would not approve forwarding shipments.

HEAVY CHEMICALS

Business Upturn Seen Due By Statisticians

Seasonal Items Begin Moving In Late Start—Defense Program Orders Seen Far in Future—Export Control No Impediment to Manufacturers—Germany Offering To Guarantee Deliveries

SLIGHT improvement in the broad list of heavy chemicals was noted in the final ten days of last month. First three weeks were no better than sluggish June business. An upward curve from here on, however would be no surprise. Three months ago, this department commented on future charts plotted by statistical departments of two major producers. This is the point at which buying was expected to broaden on one chart. The other sees the upturn delayed until fall.

Seasonal items began moving in relatively heavy quantities after remaining quiet well past the seasonal deadline. Chlorine was an active number, the heat wave bringing on high demand. Ammonia moved to the refrigeration trade. Calcium chloride, now used for dust laying on roads, is expected to benefit by parched highways.

Defense Program Talk

This department shall continue to exercise the greatest restraint in using the phrase "government defense program orders." It may be nice to talk about, but best opinion available is that it will remain "talk" both in the trade and in Washington for several months to come. Best authorities look for healthy expansion in normal industrial business before first government order is placed.

Situation surrounding exports continues interesting. Presidential proclamation controlling exports of strategic items seems to be working no hardships on reliable shippers. Great Britain can buy and ship at will.

Immediately following control set-up, there was some difficulty in getting clearance blanks which must be filled in before material can move. Blanks are now available in quantity, however, and business is moving smoothly. One major factor maintains a railroad messenger service between its offices and the State Department. Clearance papers are taken to Washington each morning, and returned officially executed the same day. The news that such speed is possible may be of importance to other producers where orders warrant the expense.

South American business remains disappointing. The German inventories on hand while the ocean lanes were free have now been worked off, but closing of European markets enter the picture prominently. Much of our material was used in South American manufactures which ultimately reached countries forced out of the market through war. This is considered the biggest factor in slow business today. And such business as there is offers indications of turning highly competitive, at least until the domestic market broadens.

Important Price Changes

ADVANCED

	July 1	July 31
Barium chlorate	$0.25	$0.26
Cobalt acetate	.71	.80½
carbonate	1.38	1.58
hydrate	1.78	1.98
Copper	.1113	.1125
Manganese sulfate	.08	.09
Sodium silicofluoride		

DECLINED

Aluminum, 100 lb.	$19.00	$18.00
Tin, anhy., tetrachloride	.26	.25¾

Germany's great interest in South America is reflected in the offer of Nazi agents to take orders on a guaranteed delivery basis. They are even offering to post cash bonds to insure materials reaching Latin American purchasers on contract date. This probably is the best comment to date on the worth of Secretary Hull's cartel plan.

Dutch East Indies seem to feel a greater sense of security now than for few months past. Orders for future delivery are coming into market for items used in rubber trade. India is taking zinc chloride used in the battery and textile industries. This item went to England in huge quantities when blackouts first started.

Microchemistry Lab. Expands

The Laboratory of Microchemistry has doubled space and facilities at 366 Fifth Avenue, N. Y. City, according to Dr. Carl Tiedcke, director. In addition to elementary analyses, laboratory is concentrating on industrial research problems.

Zialite Moves Headquarters

Zialite Corp. moves headquarters to 143 Exchange Street, Worcester, Mass., so that company can take advantage of services of its technical director, Dr. Ernest D. Wilson who now heads Chemical Engineering & Chemistry Department, Worcester Poly.

Bennett Opens New Plant

Bennett Manufacturing Company, Chicago, has opened new steel barrel plant at Hanrahan, La., New Orleans suburb.

FINE CHEMICALS

Price Break In Quicksilver Discounted

Caffeine, Theobromine Still Being Rationed to Consumers—Photographic Chemicals Feature Dull Month—Mercurial Prices Still Lagging—South American Market Takes Up Part of Slack

BUYERS of fine chemicals seemed to be observing the popular vacation month. Quiet prevailed during the period under review, good activity in the seasonal photographic items notwithstanding. Volume did not stand up with June in some quarters, and that period was no great shakes.

However, July saw no relief of the situation on caffeine and theobromine. Neither item is to be had except on contract. And contracts are being observed on a strict basis, as reported last month. Consumers holding contracts for a specified amount receive that same amount. Nothing can be done about it until things clear up abroad.

The same can be said for mercurials. This department remains bullish on quicksilver derivatives despite the so-called "break" in primary market. Here we have a decidedly sensitive situation. It can easily become misleading. For two months past, this item has been headlined in this column as the most newsworthy.

No Producer Inventory

It was admitted frankly that no inventories were being kept by producers. The market must be quiet. It can't be otherwise at these prices. But regardless of mines going into production in the United States, the price situation will not be relieved. One good consumer order will serve to maintain the present fantastic price level. And derivative prices are still out of line with the primary market as pointed out since May. Only the reentrance of import material will drive down prices. This isn't tomorrow's job, or the job of the day after. Thus, certain mercurials most probably will experience another rise.

Minor fluctuations which kept the price per flask more than $100 above normal are hardly news. It must be remembered that at $150 per flask, mercury is $2 per pound. This price makes news here only in relation to mercury derivatives which, while at a fairly high level now, are relatively low when the primary market is at approximately $2.80 a pound.

Exports continue to take up some slack. Chief buyer, of course, is South America. One producer claims it has taken up entire slack of slow domestic buying during previous slow months.

Important Price Changes

	July 1	July 31
ADVANCED		
Iodine, resublimed	$2.00	$2.15
Sodium Iodide	2.30	2.42
DECLINED		
Acid, hydrobromic	$0.42	$0.48
Ammonia bromide	.30	.31
Bromine	....	.25
Calcium bromide	.70	.65
Potassium bromide	.31	.27
Sodium bromide	.31	.27
Strontium bromide	.57	.54

Pfizer Chairman Dead

William H. Erhart, 72, board chairman of Charles Pfizer & Co., died at his Lawrence, L. I., home. Mr. Erhart was son of Charles F. Erhart, who with Charles Pfizer, a brother-in-law, founded the Pfizer Company in 1849. At the time of his death, he had been associated with the company for more than 50 years.

OBITUARIES

Dr. James F. Norris, 69, professor of organic chemistry at M. I. T., and director of its chemistry research laboratory, died at Phillips House, Boston. He had been ill for three months following an eye operation.

Dr. James F. Norris

Dr. Martin Szamatolski, 71, factory manager of Givaudan-Delawanna, Inc., died at his Hendersonville, N. C. farm, following a long illness. Dr. Szamatolski, born in Germany, started his career as assistant professor at University of Berlin. Coming to the United States in 1893, he concentrated his efforts toward production of organic colors, originating the pigments known as para red, U. S. toners, and sun red.

Phillips Rogers, 63, member of the firm Rogers & McClellan, died following a heart attack in Boston. Before forming the partnership with Mr. McClellan, in 1919, the two men had been associated while in the employ of J. A. & W. Bird & Co.

Mrs. Nell R. Goslin Jackson, 41, wife of David H. Jackson, vice-president, Croll-Reynolds, died accidentally at Bedford Hills, N. Y. . . . Alvah Horton Sabin, 89, former consulting chemist for National Lead, died at Flushing, L. I. . . . William B. Pratt, 68, chemical director of Aldox Research Company, died at his Boston home . . . C. H. Reed, 66, president Reed-Blair Laboratories died at a Stamford Conn. hospital, following an operation . . .

Burdette M. Bancroft, 61, president Presto Chemical Products, died at Elmsford, N. Y. . . . Mrs. Catherine Schlotterer, mother of Ray C. Schlotterer, secretary of Federal Wholesale Druggists, and former secretary of Drug, Chemical & Allied Section N. Y. Board of Trade, died at her Saddle River, N. J. home . . . Matthias A. Meldahl, 59, secretary, American Varnish Co., died in Chicago.

Bakelite Urea Building

Bakelite Corporation, Unit of Union Carbide and Carbon Corporation, will shortly start construction on a new building at the company's plant in Bound Brook, N. J. The building will be used for the manufacture of Bakelite urea molding materials. These products have been manufactured since 1937 in a pilot plant at Bound Brook.

Despatch Oven Election

At a recent meeting of the Board of Directors of the Despatch Oven Company, Minneapolis, Minnesota, the following officers were elected: A. E. Grapp, President and Treasurer; H. L. Grapp, Vice President & General Manager; F. H. Faber, Vice President & Sales Manager; G. C. Keyes, Vice President & Chief Engineer; G. M. Lund, Secretary & Comptroller.

Hydraulic Office Building

Construction of a modern, single-story office building adjacent to the $500,000 press factory now being erected for the Hydraulic Press Manufacturing Company at Mount Gilead, Ohio, is to be launched at once under contracts just awarded to The Austin Company, engineers and builders.

N.A.I.D.M. Meeting

National Insecticide & Disinfectant Mfgrs. Assn., has selected Hotel Roosevelt as headquarters for its convention being held Dec. 2-3.

COAL TAR CHEMICALS

Forecast On Toluol Proves Accurate

Material In "Second Hands" Is Retarding Factor—Two Oil Companies Announce Plans For Making Toluol From Petroleum—Exports to Britain OKay—Benzol Weak—Phenol Good

THIS department, in the last issue, devoted quite a bit of space to predictions concerning a greatly changed trend in toluol. This month has begun to bear out the accuracy of the forecast, with business off about 25 per cent. No weakness has developed in the market as a whole, as yet, but soft spots are likely to appear not far in the future. There is much material in hands which must realize something on a bad buy.

Only after this material is taken out of the market can anything definite be said about the future. However, this much is known. Since the war began, exports of toluol amounted to about 20 per cent. of total sales. Where this slack will be taken up is hard to see at present.

Millions of Gallons

Defense program officials are talking of orders for millions of gallons. The trade can count on this business materializing around Jan. 1, 1941. However, it must not be overlooked that due to this "millions of gallons" talk, several oil companies have been encouraged to go into production of toluol from petroleum. Universal Oil products announced a process during June, and declared plans were ready for starting production.

Last month, Shell announced immediate construction of a plant at Houston, Texas which will produce 2,000,000 gallons annually.

Licenses for exports can be had for British ports. There is now a case before the licensing board to get a shipment to Japan. No decision has been made as yet, but in view of aviation gasoline ruling, most guesses are that it will be adverse when made.

Benzol Without Price

Benzol during the latter days of July was a product without a price. During the salad days of toluol, consumers were obliged to take benzol in greater or lesser degree to get the product they were after. This has remained a drug on the market, and holders seem to feel that the time is ripe to do something about it. The chief possibility here is oil companies. It can be blended with gasoline, but not at the price recently quoted.

Xylol shares the dullness of toluol and benzol but not phenol. Latter item going into synthetic resin industry is being taken in fine quantity. Synthetic resins are experiencing one of the best years in history, pulling along all the chemicals related to it. Another nice one is creosote oil, which finds consumption on the upgrade after a protracted period of indifference.

Important Price Changes

	July 1	July 31
ADVANCED		
Toluol	$0.30	$0.32
DECLINED		
Benzene	$0.16	$0.15
Xylol	.30	.29

Probabilities are that toluol will find renewed acceptance in automotive industry which should help somewhat. Benzol seems at a decided disadvantage.

Intermediates lacked feature during period under review.

Semet-Solvay Acquisition

Semet-Solvay Co., Allied Chemical & Dye subsidiary, has acquired Wilputte Coke Oven Corp., thus combining Semet-Solvay Co., Semet-Solvay Engineering, and Wilputte Coke Oven as builders of coke ovens and by-product recovery apparatus and gas generating equipment. Louis Wilputte and staff have joined Semet-Solvay.

Dow's Tanning Research

Dow Chemical is conducting extensive research for more economical bactericides, fungicides for tanning industry. In addition to company laboratory work, a fellowship is maintained at Tanners Council Laboratory, U. of Cincinnati.

Carbide Plant Progressing

Preliminary work is progressing rapidly on the site of new Carbide plant to be erected at Texas City, Tex. Construction is expected to start next month.

SOLVENTS

Dull Summer Business Feels Export Loss

Petroleum Solvents Due for Spurt Following Labor Day—Slump in Paint Field Seen as Shifted Production—Acetone in Good Supply—Butyl Alcohol Fair—New Stoddard Standard

LAST month did not measure up to June in solvents volume. While small purchasers continued to ask for shipments, major consumers were not heavily in the market. Then, of course, there is the withdrawal of foreign markets, which has always been a strong factor in maintaining summer volume.

Petroleum solvents have held at a fair level despite the absence of automotive buying. One authority sees indicated fall business as ahead of anything anticipated. Material moving to synthetic resin industry has been a factor. The lacquer finish trade will be back Tuesday following Labor Day.

Experience in field has been that week before Labor Day always has been quietest. However, as soon as the holiday is passed, every third letter is an order.

Paint manufacturers have been making no heavy demands on solvents producers during past few months. It should be remembered, though, that first quarter business in paint trade surpassed anything in history of the industry. So present dullness in this direction represents shifted volume more than a true business slump.

Acetone is in good supply but moving normally against contracts. Material in dealers' hands is weak. Closing of export door is responsible for clearing up supply situation. This item held up for months on European demand, and was second only to toluol as a speculation item. Supply situation was acutely tight until June, although normal solvents business started moving downward around February which producers cleared up backlogs built up during last quarter of '39.

Important Price Changes

	July 1	July 31
ADVANCED		
Amyl acetate	$0.09½	$0.10½
Ethyl Alcohol, 190 proof, tks.	5.90½	5.92½
DECLINED		
Acetone	$0.06	$0.05
Butyl acetate	.09	.08

Butyl alcohol moved at a fair pace, commensurate with general level of trade. Isopropyl continued to find buyers in comfortable clusters, but methyl ethyl ketone continued weak.

Such exports as there are, are going to Great Britain and its dominions.

Stoddard Solvent Standard

Third revision of commercial standard for Stoddard Solvent has been promulgated by Bureau of Standards, U. S. Department of Commerce. This edition, CS3-40 is a revision of CS3-38. Changes are concerned with testing methods.

PIGMENTS AND FILLERS

Underlying Strength Raises Hopes of Trade

Producers Outline Four Reasons For Optimistic Outlook—July Business Slow—Flurry In Chemical Colors Reported—Carbon Black Pace Due For Spurt—Casein Shows Strength

CONSENSUS of informed opinion is that pigment market interest is centered in underlying factors influencing future trend rather than in present dull activity. Last six months of '40 could easily eclipse first half volume, it is believed. Here are some of the reasons advanced:

1. Reports that home construction will continue unabated at its present high level well into the fall.
2. Some delayed outdoor painting activity is almost certain to materialize during September and October.
3. Industrial coating sales will receive spurt through expected general plant expansion programs.
4. Increased activity in shipbuilding.

Despite this somewhat roseate forecast, July business was strictly on the slow side. Sales began flattening out in June, and buying has been at snail's pace ever since. There was a slight mid-month flurry in chemical colors, but nothing substantial. The slump even reached titanium pigments. Sales fell off for the first time since early Spring.

Prediction Borne Out

Slackening in carbon black shipments bore out the statement in our last review that major consumers were buying for inventory during June as protection against price rises. August volume will be better. Especially in view of fact that the automotive trade will shortly reach peak activity on new models.

Casein which experienced a nice lift in June, found a pleasant surprise in diversion of milk to other products. Dry milk and condensed were in demand both here and abroad. Army orders. This created a hopeful atmosphere and was quickly reflected in the price which rose fractionally. While everyone in the trade realizes a change for the better in casein was due, this quick right about face looks too good to be true to at least one factor. It is conceded that a strong market is indicated on present domestic stocks and demand. But it is conceded also that a heavy, untaken Argentine flush could upset the present balance.

Ansbacher-Siegle Moves

Ansbacher-Siegle Corp. has removed its Boston office to 34 Midway st.

Enamel Defense Program

W. Russell Greer, vice-president of The Porcelain Enamel & Manufacturing Co., Baltimore, has been appointed chairman of Committee to co-ordinate porcelain enameling industry for National Defense.

Important Price Changes

	July 1	July 31
ADVANCED		
Casein, dom.	$0.13	$0.13½
DECLINED		
Cellulose Acetate	$0.33	$0.30

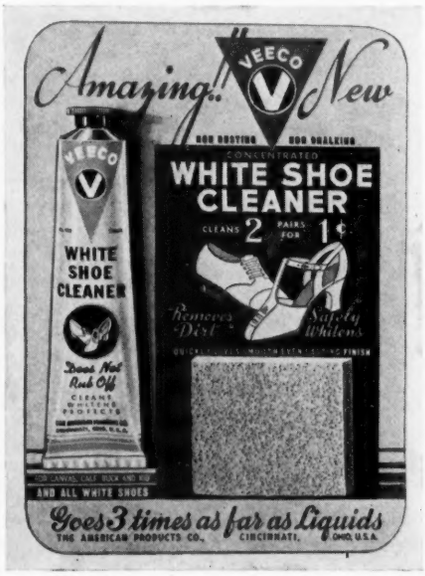
Personnel

A. B. Nixon, director, and former general manager of Hercules naval stores department has been elected vice-president and member executive committee succeeding G. G. Rheuby, resigned. Other Hercules staff shifts follow: A. E. Forster named general manager, naval stores department; J. B. Johnson named assistant general manager, explosives department; K. W. Jappe as director of purchases . . . Dr. J. Merriam Peterson, head, testing department appointed assistant professor of chemical engineering at Cooper Union . . . Roderick M. Ladd has joined Hooker Electrochemical, representing general Hooker line in Metropolitan N. Y. area.

Dr. Max Y. Seaton elected president Curtin-Howe Corp., succeeding Dr. Leo P. Curtin...Harold E. Burdick joins research staff, Standard Ultramarine... R. T. Kennedy, named manager, Atlantic division, Pennsylvania Refining...C. L. Barrett named vice-president, charge of sales, Pomona Pump; W. D. Turnbull succeeds him as general sales manager in charge of recently established N. Y. office . . . J. A. Burns named sales agent in Pittsburgh territory by Stroock & Wittenberg . . . Harry M. Cotey appointed sales director, Midwest division, Ansbacher-Siegle Corp., in charge of new Chicago office . . . Walter C. Davis represents Tolhurst Centrifugal, DeBothezat ventilating divisions, American Mche. & Metals, in Md., Va., and Dist. of Col.

H. M. Ellsworth, former advertising manager, Sterling Products named advertising manager, Pennsylvania Salt, succeeding Miss I. J. Dennery, resigned . . . Claire C. Balke has rejoined research staff, Fansteel Metallurgical Corp. . . . George E. Petitt, former first vice-president, Chilean Nitrate Sales, becomes vice-president, charge of sales, Potash Corp. of America succeeding C. C. Smith, resigned.

Fred E. Loud has been elected president of newly reorganized Kessler Chemical; other officers: L. W. Wasum, vice-president and technical director; J. Rodman Tompkins, secretary; David Levin, treasurer . . . Sumner Pond named manager Universal Gear Corp. Detroit office . . . Bradway S. Phillips appointed development engineer Continental Carbon . . . William A. Maxwell joins research staff, Foote Mineral . . . Paul Muller named Eastern sales manager, Owens-Illinois Glass . . . Cliff Smith named southern representative Onyx Oil & Chemical . . . C. O. Bartlett appointed Detroit district manager, Bartlett-Snow . . . J. C. Reisinger has been made manager, Algin division, Kelco . . . Errett Deck named Northwest representative American Potash Institute . . . Walter B. Morehouse named sales manager, paper division, National Oil Products.



American Products Co., Cincinnati, is merchandising its Veeco White Shoe Cleaner with a counter display card which holds a tube of the product as well as the Flexine applicator.

Colgate Agrees

Colgate-Palmolive-Peet and its subsidiary, Kirkman & Son, has entered into a stipulation with Federal Trade Commission, agreeing to cease and desist using certain claims in their advertisements. Products involved were Palmolive Soap, Cashmere Boquet, Colgate Rapid Shave Cream, Palmolive Shave Creams, Colgate Dental Cream and Kirkman Soap Flakes.

Desert Chemical Builds

Desert Chemical is rushing completion of plant at Dale Lake, Cal., for production of anhydrous sodium sulfate. Plant will be geared to produce 50,000 tons next year, but figure can be adjusted if market survey now in progress shows greater demand.

ADVERTISEMENT—*This entire page is a paid advertisement.* *Prepared Monthly by U. S. Industrial Chemicals, Inc.*

U.S.I. CHEMICAL NEWS

August ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1940

Extrusion Process For Plastics Has Wide Possibilities

Strips, Rods, Tubes are Among Parts Made with Low Die Costs

Broadening of the field of application for plastics is foreseen as the result of a new extrusion process, which is said to make possible the production of long lengths, rods, tubes, and many other shapes with a relatively low cost for dies. Physical characteristics of the extruded parts are reported to be

(*Continued on next page*)

Strips of extruded plastics are woven like reed to form attractive, colorful furniture — a typical application of the extrusion process.

Ethyl Cellulose, Shellac Mixed by Use of Alcohol

MIDLAND, Mich. — How ethyl cellulose and shellac can be successfully mixed to form a granular product of uniform size is disclosed in a patent granted to two inventors here.

The process, it is said, consists in adding a concentrated solution of shellac in ethyl alcohol to an aqueous suspension of water-wet ethyl cellulose. This suspension, according to the patent, can be prepared by pouring an alcoholic solution of ethyl cellulose into water and stirring the mixture.

The product, the inventors claim, is readily soluble in lacquer solvents, and can be used also as a hot melt coating. The process, it is reported, is also applicable to other water-insoluble lower alkyl ethers of cellulose, such as methyl cellulose.

Ethyl Alcohol is produced by U.S.I.

Window Cleaning Solvent Is Available Without Dye

U.S.I.'s solvent concentrate for use in the preparation of liquid glass cleaners has now been made available in an untinted form for those manufacturers who prefer it.

It will continue to be sold also with the tint added, and manufacturers may select either the dyed or the undyed solvent. The two forms are identical in all other respects, and are equally efficacious. All that is necessary to prepare the finished cleaning compound is to add water to the concentrate.

U.S.I. will be glad to furnish additional information on this solvent.

New Enamels Offer Opportunities For Color in Low-Cost Plastics

Highly Adherent Finishes in Wide Range of Colors are Easily Applied to Surface of Inexpensive Brown and Black Materials

Manufacturers using plastic housings or other parts in their products can now get the added sales advantages of bright, cheerful colors at relatively low cost with the aid of recently developed enamels, it is reported. The new finishes allow manufacturers to use the less expensive brown and black plastic materials, and still give finished products a colorful appearance free from a "painted" look.

While practically any desired color can of course be produced in the color-through type of plastics, these materials are somewhat more expensive, and many manufacturers have been interested in the possibility of applying color to the less costly plastics.

High Adherence Needed

The biggest stumbling-block in coloring the brown and black plastics has been the high degree of adherence necessary for the successful coating of the smooth, "greasy" plastic surface.

This difficulty has been overcome, it is claimed, with the new enamels, which are of the baking type, and which can be supplied to give an opalescent finish if desired. It is reported that these finishes have been subjected to severe abrasion tests without marring or chipping.

The finishes, it is said, are preferably applied by spray, and are baked at 250°F. For the opalescent finishes, baking for one hour is required. Baking time for the non-opalescent finishes ranges from 45 to 60 minutes.

Many Colors Available

The range of colors in these new finishes offers plenty of opportunity for variation to meet consumer preferences. The opalescent finishes are said to be available in taupe, red, gunmetal, silver, brown, gray, green, and two shades of blue. The non-opalescent coatings are made in red, ivory, white, three shades of green, and two of blue.

In addition to their manufacturing economies, the enamels are expected to offer an opportunity to reduce inventories, since parts can all be produced from a single color of plastic, and can be finished for the require-

(*Continued on next page*)

C. E. Adams Appointed to National Defense Staff

WASHINGTON, D. C.—Charles E. Adams, chairman of the board of U. S. Industrial Alcohol Co. and of Air Reduction Co., has joined the staff of Edward R. Stettinius, Jr., member of the National Defense Advisory Commission in charge of raw materials.

Mr. Adams will serve as senior administrative assistant to Mr. Stettinius, and will devote full time to his new duties.

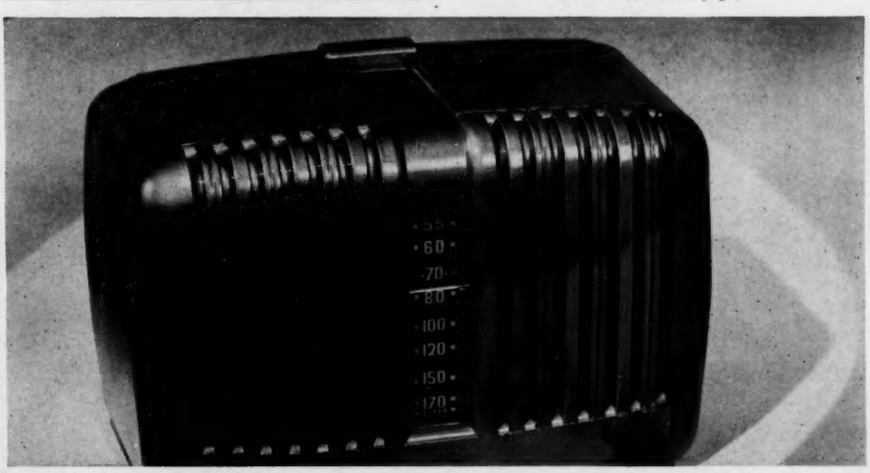
Ethyl Acetoacetate, because of its unusual organic structure, offers opportunities for a wide range of chemical reactions, leading to an extended list of valuable products. Outstanding use is as an intermediate in the production of dyes of the Hansa Yellow group. A data sheet on the specifications and properties of this interesting compound has been prepared for free distribution. Write U.S.I. and ask for Bulletin EA.

New Processed Drying Oils Are Made by Distillation

CHICAGO, Ill.—Efficient drying oils for use in mixing paints, varnishes, and enamels can be prepared from fats and oil by a new distillation process, it has been announced by a manufacturer here.

The process, it is said, isolates the fatty acids with good drying properties from those with non-drying properties, and can be applied to such oils as cottonseed, soybean, and fish.

The development of this process is expected to represent another step in the direction of freeing the paint and varnish industry from dependence on foreign sources of supply for drying oils. The new oils, it is reported, will be available in large quantities.



Radio cabinets and many other parts can now be molded from inexpensive plastics, and can be given the attractive features of bright coloring by coating with recently developed finishes that have the high adherence needed for plastic surfaces.

ADVERTISEMENT—*This entire page is a paid advertisement.*

August ★ **U.S.I. CHEMICAL NEWS** ★ 1940

Breaks Tight Emulsions With Butyl, Amyl Alcohol

CHICAGO, Ill. — Reagents suitable for breaking various kinds of water-in-oil emulsions can be prepared with the aid of such alcohols as butyl or amyl, it is claimed in a patent granted to an inventor here.

The reagents, it is said, can be used in breaking emulsions so tight that they do not yield to known demulsifying agents. In preparing the reagent, according to the patent, the butyl or amyl alcohol is saturated with formaldehyde, and then mixed with a naphthenic acid soap, such as sodium naphthenate. When thoroughly mixed, the materials are said to form a permanent solution. An inhibitor may be added to prevent the settling out of small amounts of solid material.

Butyl Alcohol and Amyl Alcohol are produced by U.S.I.

Plastic Extrusion Process

(*Continued from previous page*)

the same as those of parts molded by injection or compression.

One extremely interesting possibility is seen in the manufacture of furniture. Extruded strips of the plastic are woven, it is said, in the same manner as reed or rattan, and very attractive effects can be obtained by the use of transparent, translucent, and opaque plastics and of harmonizing or contrasting colors.

Other Potential Uses

Because of the low die cost, it is expected that the extrusion process will permit the use of plastics in a wide range of other applications. Some of the possibilities include radio grilles and dials, watch crystals, decorative moldings, and display panels.

U.S.I. will be glad to refer readers to a source of further information on extruded plastics.

New Chrome Greens Perfected

DETROIT, Mich.—A new line of chrome greens, said to have many advantages over previous types, has been placed on the market by a manufacturer here.

Laboratory tests, it is claimed, show that the new greens are distinctly superior in light-fastness, strength of color, and ease of grinding. It is also said that the various greens in the line can be blended to produce intermediate shades that are clean and true.

The colors are described as true, neutral, nitrate type greens that show a minimum of color change when they dry.

Pouring Spout Improved On U.S.I.'s 5-Gallon Drums

More convenient pouring into small containers is made possible by the improved spout construction on U.S.I.'s new 5-gallon drums, which will be used for both solvents and denatured alcohol.

The new spout is of the telescoping type,

and is provided with an extra link having a small orifice. The link is bent at a angle that also facilitates pouring into small containers.

The link is removable, and if faster pouring is desired, all that is necessary is to unscrew the link and pour through the larger orifice in the main part of the spout.

Issues Report on Methods of Preparing Steel for Painting

WASHINGTON, D. C.—Surface treatment methods which may be applied to plain or galvanized steel surfaces prior to painting are described in a report recently issued here.

The report discusses the results of accelerated corrosion tests designed to determine the relative effect of the various treatments in improving the protective value of the paint.

U.S.I. will gladly refer readers to a source from which the report can be obtained.

New Enamels for Plastics

(*Continued from previous page*)

ments of specific models. The formulation of the finishes can be adjusted, it is said, to give satisfactory adherence on different types of plastics.

U.S.I. will refer readers to a source of further information on these finishes.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

A new inhibitor of the organic chromium type is reported to be highly effective in controlling both oxidation and sulphide types of corrosion. It is reported that the inhibitor has been successfully used in cooling systems, steam systems, air washers, and sour gas systems. **(No. 360)**

U S I

A pour point depressant is said to permit the use of heavy gear lubricants in such applications as the automotive field and other service for which their high pour point has previously made them unsuitable. **(No. 361)**

U S I

Skin protection is afforded, it is claimed, by a new series of creams and ointments. One product in the line is said to protect against grease, paint, asphalt, tar, printing ink, and waxes; a second against petroleum products and coolant and cutting compounds; a third against acids. **(No. 362)**

U S I

An air-drying enamel, according to the manufacturer, is immune to concentrated acids, such as sulphuric, nitric, hydrochloric, and hydrofluoric, and also to alkalis and gases. It is said that the enamel can be applied to metal, wood, concrete, glass, rubber, and paper. **(No. 363)**

U S I

A chemically treated paper is normally white, turns deep blue when temperature reaches a predetermined point, it is reported. Maker says that paper can be prepared to change color at many different temperature points. **(No. 364)**

U S I

New finishes are said to be especially designed for use with infrared baking equipment. It is reported that the finishes include both undercoats and top coats in a full range of plain colors, and that hammered effects and wrinkle finishes are also available. **(No. 365)**

U S I

A titanium dioxide pigment is reported to be especially suitable for use in tinted exterior nitrocellulose lacquers and synthetic resin enamels. The pigment is said to display good resistance to early hazing, excellent gloss retention, and ease of repolishing. **(No. 366)**

U S I

A metal polish incorporates a light, fluffy abrasive, according to a recent patent. Polish is said to be suitable for use on silver, brass, copper, gold, nickel and chromium plating, and other metals. **(No. 367)**

U S I

A galvanizing process utilizes zinc ore or by-products with insoluble anodes in a solution of ammonia and ammonium salts, it is reported. It is said that steel strip galvanized by this process shows excellent adherence for paint without pretreatment. **(No. 368)**

U S I

Potassium sodium ferricyanide is now available from a domestic source, and is said to be suitable for making blue print paper and for other applications for which red prussiate of potash has been employed. **(No. 369)**

U.S.I. INDUSTRIAL CHEMICALS, INC.

60 EAST 42ND ST., N.Y. (U.S.I.) BRANCHES IN ALL PRINCIPAL CITIES

A SUBSIDIARY OF U. S. INDUSTRIAL ALCOHOL CO.

ALCOHOLS
Amyl Alcohol
Butyl Alcohol
Fusel Oil—Refined
Methanol

Ethyl Alcohol
Anhydrous
Absolute
C. P. 96%
Pure (190 proof)
Specially Denatured
Completely Denatured
U. S. I. (Denatured Alcohol Anti-freeze)
*Super Pyro Anti-freeze
*Solox Proprietary Solvent

***ANSOLS**
Ansol M
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ESTERS, ACETATES
Acetic Ether
Amyl Acetate
Butyl Acetate
Ethyl Acetate

ESTERS, ETHYL
*Diatol
Diethyl Carbonate
Diethyl Oxalate
Ethyl Chlorocarbonate
Ethyl Formate
Ethyl Lactate

*Registered Trade Mark

ESTERS, PHTHALATES
Diamyl Phthalate
Dibutyl Phthalate
Diethyl Phthalate
Dimethyl Phthalate

OTHER ESTERS
Amyl Propionate
Butyl Propionate
Dibutyl Oxalate

INTERMEDIATES
Acetoacetanilid
Acetoacet-o-chloranilid
Acetoacet-o-toluidid
Ethyl Acetoacetate
Sodium Ethyl Oxalacetate

ETHERS
Ethyl Ether
Ethyl Ether Absolute—A.C.S.

OTHER PRODUCTS
Acetone, C.P.
Collodions
*Curbay Binders
*Curbay X (Powder)
Derex
Ethylene
Methyl Acetone
Nitrocellulose Solutions
Potash, Agricultural
*Vacatone
*Curbay B-G

RAW MATERIALS

Lack Of Buying Interest Softens Market

Uncertainty Surrounding Chinawood Supply Keeps Price Firm —Price Shading Rumored on Dull Items—Big Flaxseed Crop Hurts Linseed—Naval Stores Off—Savannah Trading Revised

RAW materials market during the past month couldn't excite even the slightest interest in buyers. Some material moved on skimpy replacement orders. Strong spots in market are the result of supply situation rather than demand. And still there is talk that business is passing at below levels generally quoted.

Pricewise the trend was down. Perilla, Carnauba wax, castor oil, and linseed all slumped. Chinawood gained a cent, and oiticica half a cent, but these are import items, and these prices are maintained because of doubt surrounding shipments. "Everyone inquires, but few buy" would be a good summation of Chinawood business during the period under review.

Although linseed moved in fair volume, market took on a bearish tone when government crop reporting board estimated a flaxseed crop of 28,801,000 bushels, more than 8,000,000 over last year. This crop, if it materializes in line with the predictions, will be the largest since 1924. Whether the prompt decline in oil price will stimulate consumer interest probably will be answered within the next few weeks.

Soybean oil was dull, with price shading a decided possibility. This quiet extended to all edibles.

Naval stores shared the general lack of interest for buyers. Rosin prices are at levels which should attract volume consumers, but whether or not bargain hunters can be lured from their hiding places remains to be seen.

Savannah quotations are now based on 100 lbs., rather than the old 280 lb. unit. Under the new system, there is a uniform tare allowance of 17 per cent. for barrels and the actual allowance is made for steel drums. It is believed generally that after a short acquaintance with the new system, traders will appreciate its simplicity.

The Exchange also adopted 7.2 pounds as the standard turpentine gallon. There can be no question, however, that a change for the better in business would be more welcome than a change in system. While business continued to move at an evenly fair pace, it is below scope of operations predicted for this period a while back. Lack of export demand is another factor which has hurt.

Chemical Lime Reorganization

Chemical Lime Co., Inc., which has been operating for 2 years under 77-B, will be reorganized under the Act if a satisfactory basis can be arranged. Judge Albert N. Watson sitting in a Federal Court at Scranton, Pa., ordered Trustee Clarence P. Winn to file a plan for reorganization or file his reasons why the company cannot be brought out of its bankrupt status.

Important Price Changes

	July 1	July 31
ADVANCED		
Oil, Chinawood	$0.22½	$0.24¾
Oiticica	.17	.17½
Turpentine, spirits	.32½	.33½
DECLINED		
Copra	$0.0185	$0.0140
Oil, Castor	.12¾	.11¾
Coconut	.07⅝	.07½
Linseed	.098	.091
Perilla	.18	.17
Wax, Carnauba	.69	.68

Mining Congress Theme

Leading executives and operating men of the metal mining industry will meet in Colorado Springs, Colorado, September 16-19, 1940, to discuss mining's role in the national defense program as well as operating and economic problems of the industry.

A full session of the convention will be given over to consideration of the part which minerals play in the present emergency. Another session will study and discuss the effect of World War II on supplies, international movements, domestic markets, prices, etc., of each of the principal metals. Leading figures in government as well as in industry will share the spotlight on the program.

Cook Paint Expansion

Cook Paint & Varnish Co., is building an addition to its plant at Kansas City. An electrically controlled steel bridge is also being installed to facilitate intra-plant transportation.

Lustrite Moves

The Lustrite Corp., has moved its headquarters to 30 Irving Place, N. Y. City, where greater space is available. Business expansion prompted the move, company states.

AGRICULTURAL CHEMICALS

New Season Holds To '39-'40 Pace

Ammonia Sulfate Unavailable on Spot—Export Demand at $10 Premium Goes Begging—Cyanamid Price Up—Pioneer Potash Withholds Quotations—Nitrogen Solution at Same Price

CONTRACTS for coming fertilizer season call for business on the same level as last year. Cyanamid contracts are being signed now after a delay during which details were ironed out. Last price of old contract holds until Sept. 1, after which new prices take effect.

New Cyanamid price shows a 7 cent raise. Contracts are on the basis of $1.40 per unit of nitrogen, and will run as usual, until June 1, 1941.

Most sought after material among agricultural chemicals is ammonia sulfate. Consumers are being held to original quantities named in last year's contracts. Thus, though an order for additional material was accepted and shipped in addition to contract commitment, this amount will not be taken into consideration on new contracts.

Supply situation remains acute, due to the fact that many buyers formerly supplied from abroad now look to domestic producers. These are being taken care of, as far as limit of supply can be spread. No material is being considered for export notwithstanding a $10 per ton premium offered by brokers seeking to contact material.

Important Price Changes

	July 1	July 31
ADVANCED		
Cyanamid	$1.33	$1.40
DECLINED		
Fish scrap	$3.60	$3.35
Nitrogenous material	1.95	1.75
Superphosphate	9.00	8.50

Contracts on sulfate are being renewed at last price of old contract. A $1 price rise is scheduled on Jan. 1. Formerly producers staggered raises at 25 cents per month up until first of new year in order to induce consumer to accept early shipments. This principle was ignored this year for reasons indicated above.

No price increases have been announced on Barrett nitrogen solutions. Current price, to be maintained through new fertilizer season is $1.2158 per unit of nitrogen. Pioneer Potash is offering no prices due to uncertainty of shipments from the other side.

Sodium Acetate users prefer "SODACET"

(Trade Mark)

Sodium Acetate Special 90%

Pound for pound, "SODACET" contains 50% more actual Sodium Acetate than the commercial grade.

Also available

60% Sodium Acetate—Sodium Diacetate—Anhydrous Sodium Acetate

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4750 PINE AVENUE
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Benzol (all grades) . . . Toluol (Industrial and Nitration) . . . Xylol (10° and Industrial) . . . Solvent Naphtha (Including High Flash) . . . Naphthalene . . . Shingle Stain Oil . . . Refined Tars . . . Pitch Coke . . . Industrial Coal Tar Pitches . . . Flotation Oils . . . Creosote

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Coal Tar Roofing Materials . . . Waterproofing and Dampproofing Materials . . . Tarmac Road Tar Materials . . . Bituminous Base Paints . . . Coal . . . Coke . . . Benzol Recovery Plants . . . Naphthalene Removal Apparatus . . . Sulphur Recovery Apparatus . . . Phenol Removal Apparatus . . . By-Product Recovery Apparatus . . . Fast's Self-aligning Couplings . . . Piston Rings . . . Valves . . . Pressure-treated Lumber

PHENOL—All standard grades such as 82% and 90% and 39° Melting Point Pure.

CRESOL—U.S.P. with very close cut distillation range and light color, for pharmaceutical purposes—Meta-Para Cresol with high meta cresol content—Resin cresols close cut to wide boiling with guaranteed meta cresol contents and clean odor.

CRESYLIC ACID—Many distillation ranges appropriate for all established uses—pale color—clean odor—total impurities besides water not exceeding one half of one percent.

TAR ACID OILS—Frozen crystal free at 0°C.—good emulsion-forming properties—low bensophenol content—appropriate for low to high coefficiencies with tar acid contents as required.

KOPPERS COMPANY · PITTSBURGH, PA.

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ANTI-OXIDANTS
OIL PURIFICATION
ANIMAL DIPS
INEXPENSIVE DISINFECTANTS
FLOTATION PROCESSES
INSECTICIDES

PRICES CURRENT

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f.o.b. works are specified as such. Import chemicals are so designated.

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1939 Average $1.24 - Jan. 1940 $1.17 - July 1940 $1.22

	Current Market	1940 Low	1940 High	1939 Low	1939 High
Acetaldehyde, drs, c-l, wks lb.	...	.11	...	.11	.10	.14
Acetaldol, 95%, 55 gal drs wks lb.	.11	.12	.11	.25	.21	.25
Acetamide, tech, lcl, kgs lb.	.28	.30	.28	.50	.28	.50
Acetanilid, tech, 150 lb bbls lb.	...	.22	...	.22	.22	.29
Acetic Anhydride, drs, f.o.b. wks, frt all'd ....lb.	.10½	.11½	.10½	.11½	.10½	.11
Acetin, tech, drs .....lb.	...	.33	...	.33	...	.33
Acetone, tks, f.o.b. wks, frt all'd .....lb.	...	.05	.05	.06	.04¼	.06
drs, c-l, f.o.b. wks, frt all'd' lb.	...	.06½	.06½	.07½	.05¾	.07¼
Acetyl chloride, 100 lb cbys lb.	.55	.68	.55	.68	.55	.68
Abietic, kgs, bbls .....lb.	.08¾	.09	.08¾	.09	.08¾	.09
Acetic, 28%, 400 lb bbls, c-l, wks ..... 100 lbs.	...	2.23	...	2.23	...	2.23
glacial, bbls, c-l, wks 100 lbs.	...	7.62	...	7.62	...	7.62
glacial, USP bbls, c-l, wks, ... 100 lbs.	...	10.25	...	10.25	...	10.25
Acetic Acid Glacial, *Synthetic* 99.5%, cbys, cases, delv lb.	...	.0918	...	...	...	...
99.5%, 110-gal dr, delv lb.	...	.0868	...	...	...	...
USP XI, cases, cbys, delv ..... lb.	...	.11	...	...	...	...
USP XI, 110-gal drs, delv ..... lb.	.10¼	.10½	...	...	...	...
CP, cases, cbys, delv ..lb.	...	.14	...	...	...	...
CP, 55-gal drs, delv ...lb.	.13¼	.13½	...	...	...	...
Acetylsalicylic, USP, 225 lb bbls ..... lb.	...	.45	...	.45	.40	.50
Adipic, kgs, bbls ..... lb.	...	.31	.31	.72	...	.72
Anthranilic, ref'd, bbls...lb.	1.15	1.20	1.15	1.20	1.15	1.20
tech bbls .....lb.	...	.75	...	.75	...	.75
Ascorbic, bot .....oz.	2.25	2.50	2.25	3.00	2.75	3.25
Battery, cbys, wks ...100 lbs.	1.60	2.55	1.60	2.55	1.60	2.55
Benzoic tech, 100 lb kgs lb.	.43	.47	.43	.47	.43	.47
USP, 100 lb kgs .....lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran, 80 tons, bgs, delv ..... ton e	93.50	96.00	...	96.00	...	96.00
Broenner's, bbls .....lb.	...	1.11	...	1.11	...	1.11
Butyric, edible, c-l, wks, cbys lb.	1.20	1.30	1.20	1.30	1.20	1.30
synthetic, c-l, drs, wks .lb.	...	.22	...	.22	...	.22
wks, lcl .....lb.	...	.23	...	.23	...	.23
tks, wks .....lb.	...	.21	...	.21	...	.21
Camphoric, drs .....lb.	...	7.00	5.50	7.00	5.50	5.70
Caproic, normal, drs .....lb.	.30	.35	.35	.40	...	.35
Chicago, bbls .....lb.	...	2.10	...	2.10	...	2.10
Chlorosulfonic, 1500 lb drs, wks .....lb.	.03½	.05	.03½	.05	.03½	.05
Chromic, 99¾%, drs, delv lb.	.15¼	.17¼	.15¼	.17¼	.15¼	.17¼
Citric, USP, crys, 230 lb bbls ..... lb. b	.20	.21	.20	.21½	.20	.22½
anhyd, gran bbls .....lb b	...	.23	...	.23	.23	.25
Cleve's, 250 lb bbls .....lb.	...	.57	...	.57	...	.57
Cresylic, 99%, straw, HB, drs, wks, frt equal ..gal.	.68	.70	.68	.70	.49	.70
99%, straw, LB, drs, wks, frt equal .....gal.	.68	.75	.68	.75	.55	.75
resin grade, drs, wks, frt equal .....lb.	.08¾	.09¾	.08¾	.09¾	.08¼	.09¾
Crotonic, bbls, delv .....lb.	.21	.50	.21	.50	.21	.50
Formic, tech, 140 lb drs..lb.	.10½	.11½	.10½	.11½	.10½	.11½
Fumaric, bbls .....lb.	.24	.28	.24	.75	...	.75
Fuming, see Sulfuric (Oleum)						
Gallic, tech, bbls .....lb.	.90	.93	.75	.93	.70	.73
USP, bbls .....lb.	.92	.95	.92	.95	.77	.81
Gamma, 225 lb bbls, wks..lb.	...	.85	...	.85	...	.85
H, 225 lb bbls, wks .....lb.	...	.45	...	.45	.50	.55
Hydriodic, USP, 47%...lb.	...	2.30	...	2.30	...	2.30
Hydrobromic, 34% conct 155 lb cbys, wks .....lb.	.42	.44	.42	.44	.42	.44
Hydrochloric, see muriatic						
Hydrofluoric, 30%, 400 lb bbls, wks .....lb.	.06	.06½	.06	.06½	.06	.07½
Hydrofluosilicic, 35%, 400 bbls, wks .....lb.	.09	.09¼	.09	.09½	.09	.09½
Lactic, 22%, dark, 500 lb bbls lb.	.02½	.03¾	.02½	.03¾	.02½	.02¾
22%, light ref'd, bbls..lb.	.03½	.03¾	.03½	.03¾	.03½	.03¾
44%, light, 500 lb bbls..lb.	.05½	.06¾	.05½	.06¾	.05½	.05¾
44%, dark, 500 lb bbls..lb.	.06½	.07¾	.06½	.07¾	.06½	.06¾
50%, water white, 500 lb bbls .....lb.	.10½	.11½	.10½	.11½	.10½	.11½
Lauric, drs .....lb.	.12½	.13	.12½	.14½	.11¾	.12¼
Laurent's, 250 lb bbls ....lb.	...	.45	.45	.46	.45	.46
Maleic, powd, kgs .....lb.	...	.30	.30	.40	.30	.40
Malic, powd, kgs .....lb.	...	.47	...	.47	.45	.60
Mixed, tks, wks .....N unit	.05	.06	.05	.07¼	.06½	.07¼
S unit	.0085	.009	.008	.009	.008	.009
Monochloracetic, tech, bbls lb.	.15	.18	.15	.18	.16	.18
Monosulfonic, bbls .....lb.	...	1.50	1.50	1.60	1.50	1.60
Muriatic, 18°, 120 lb cbys, c-l, wks .....100 lb.	...	1.50	...	1.50	...	1.50
tks, wks .....100 lb.	...	1.05	1.00	1.05	...	1.00
20°, cbys, c-l, wks..100 lb.	...	1.75	...	1.75	...	1.75
tks, wks .....100 lb.	...	1.15	1.10	1.15	...	1.10
22°, c-l, cbys, wks..100 lb.	...	2.25	...	2.25	...	2.25
tks, wks .....100 lb.	...	1.65	1.60	1.65	...	1.60
CP, cbys .....lb.	.06½	.08	.06½	.08	.06½	.07½
N & W, 250 lb bbls .....lb.	.85	.87	.85	.87	.85	.87
Naphthenic, 240-280 s.v., drs lb.	.10	nom.	nom.	.14	.10	.14
Naphthionic, tech, 250 lb bbls lb.	.60	.65	.60	.65	.60	.65
Nitric, 36°, 135 lb cbys, c-l, wks .....100 lb. c	...	5.00	...	5.00	...	5.00
38°, c-l, cbys, wks 100 lb. c	...	5.50	...	5.50	...	5.50
40°, cbys, c-l, wks 100 lb. c	...	6.00	...	6.00	...	6.00
42°, c-l, cbys, wks 100 lb. c	...	6.50	...	6.50	...	6.50
CP, cbys, delv .....lb.	.11½	.13	.11½	.13	.11½	.12½
Oxalic, 300 lb bbls, wks, or N Y .....lb.	.10¾	.12	.10¾	.12	.10¾	.12
Phosphoric, 85%, USP, cbys lb.	...	.12	.12	.14	.12	.14
50%, acid, c-l, drs, wks..lb.	...	.12	.06	.12	.06	.08
75%, acid, c-l, drs, wks..lb.	...	.07½	...	.07½	...	.07½
Picramic, 300 lb bbls, wks lb.	.65	.70	.65	.70	.65	.70
Picric, kgs, wks .....lb.	...	.35	.35	.40	.35	.40
Propionic, 98% wks, drs..lb.	...	.25	...	.25	...	.22
80% .....lb.	.14	.20	...	.20	.16	.17½
Pyrogallic, tech, lump, pwd, bbls .....lb.	...	1.20	1.05	1.20	1.45	1.63
cryst, USP .....lb.	1.70	2.25	1.55	2.25	1.55	2.10
Ricinoleic, bbls .....lb.	.27	.33	.27	.33	...	.35
Salicylic, tech, 125 lb bbls, wks .....lb.	...	.33	...	.33	...	.33
USP, bbls .....lb.	.35	.40	.35	.40	.35	.40
Sebacic, tech, drs, wks ..lb.	no prices		no prices		...	...
Succinic, bbls .....lb.	...	.75	...	.75	...	.75
Sulfanilic, 250 lb bbls, wks lb.	...	.17	.17	.18	.17	.18
Sulfuric, 60°, tks, wks...ton	...	13.00	...	13.00	...	13.00
c-l, cbys, wks ....100 lb.	...	1.25	...	1.25	...	1.25
66°, tks, wks .....ton	...	16.50	...	16.50	...	16.50
c-l, cbys, wks ....100 lb.	...	1:50	...	1.50	...	1.50
CP, cbys, wks .....lb.	.06½	.08	.06½	.08	.06½	.07½
Fuming (Oleum) 20% tks, wks .....ton	...	18.50	...	18.50	...	18.50
Tannic, tech, 300 lb bbls ..lb.	.54	.56	.44	.56	.40	.47
Tartaric, USP, gran, powd, 300 lb bbls .....lb.	.41¼	.42¼	.35¼	.42¼	.27½	.31¼
Tobias, 250 lb bbls .....lb.	.55	.60	.55	.60	.55	.67
Trichloroacetic bottles ....lb.	2.00	2.50	2.00	2.50	2.00	2.50
kgs .....lb.	...	1.75	...	1.75	...	1.75
Tungstic, tech, bbls .....lb.	no prices		no prices		1.70	1.80
Vanadic, drs, wks .....lb.	no prices		no prices		1.10	1.20
Albumen, light flake, 225 lb. bbls .....lb.	.55	.62	.55	.62	.52	.68
dark, bbls .....lb.	.13	.18	.13	.18	.13	.18
egg, edible .....lb.	.54	.60	.53	.62	.58	.78
Alcohol, Amyl (from Pentane) tks, delv .....lb.	...	.101	...	.101	...	.101
c-l, drs, delv .....lb.	...	.111	...	.111	...	.111
lcl, drs, delv .....lb.	...	.121	...	.121	...	.121
Amyl, normal 1-c-l drs	...	.08½	...	.08½	...	.08½
Wyandotte, Mich. .....lb.	...	.25	...	...	...	...
secondary, tks, delv ...lb.						
drs, c-l., delv E of Rockies .....lb.	...	.09½	...	09½	...	.09½
Benzyl, cans .....lb.	...	.68	.68	1.00	.68	1.00
Butyl, normal, tks, f.o.b. wks, frt all'd .....lb. d	...	.08	...	.09	.07	.09
c-l, drs, f.o.b. wks, frt all'd .....lb. d	...	.09	...	.10	.08	.10
Butyl, secondary, tks, delv ..... lb. d	...	.06½	...	.06½	.05½	.06½
c-l, drs, delv .....lb. d	...	.07½	...	.07½	.06½	.07½
Capryl, drs, tech, wks...lb.	...	.85	...	.85	...	.85
Cinnamic, bottles .....lb.	2.00	2.50	2.00	2.50	2.00	2.50
Denatured, CD, 14, c-l drs, wks .....gal. e	.31½	.36½	.31½	.36½	.27½	.36½
tks, East, wks .....gal.	...	.25½	...	.25½	.21½	.25½
Western schedule, c-l, drs, wks .....gal. e	...	.36½	.34½	.36½	.34½	.37
c-l, drs, wks .....gal. e	...	.26½	.21½	.26½	.19½	.22
Denatured, SD, No. 1, tks,	...	.22½	...	.22½	.25½	28½
Diacetone, pure, c-l, drs, delv .....lb. f	...	.12	...	.12	.09	.12
tech, contract, drs, c-l, delv .....lb.	...	.11½	...	.11½	.08½	.11½

a Powdered boric acid $5 a ton higher in each case; USP $15 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls.; *y* Price given is per gal.

c Yellow grades 25c per 100 lbs. less in each case; *d* Spot prices are 1c higher; *e* Anhydrous is 5c higher in each case; *f* Pure prices are 1c higher in each case.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

	Current Market	1940 Low	1940 High	1939 Low	1939 High
Alcohols (continued):					
Ethyl, 190 proof, molasses, tks gal. *g*	...	5.92½	...	5.92½	4.46	4.48½
c-l, drs gal. *g*	...	5.98½	...	5.98½	4.49	4.54½
c-l, bbls gal. *g*	...	5.99½	...	5.99½	4.53	4.55½
Furfuryl, tech, 500 lb drs lb.	...	.35	.25	.35	.25	.35
Hexyl, secondary tks, delv lb.	...	.12	...	.12	...	.12
c-l, drs, delv lb.	...	.13	...	.13	...	.13
Normal, drs, wks lb.	3.25	3.50	3.25	3.50	3.25	3.50
Isoamyl, prim, cans, wks lb.	...	.32	...	.32	...	.32
drs, lcl, delv lb.	...	.27	...	.27	...	.27
Isobutyl, ref'd, lcl, drs lb.	...	.073	...	.073	.073	.09
c-l, drs lb.	...	.069	...	.069	.068	.08½
tks lb.	...	.059	...	.059	...	.07½
Isopropyl, refd, 91%, c-l, drs, f.o.b. wks, frt all'd lb.	...	.65	...	.65	...	.36
Ref'd 98%, drs, f.o.b. wks, frt all'd gal.	...	.65	...	.65	...	.41
Tech 91% drs, above terms gal.	...	.33½	...	.33½	...	.33½
tks, same terms gal.	...	.28½	...	.28½	...	.28½
Tech 98%, drs, above terms gal.	...	.36	.36	.37½	...	.37½
tks, above terms gal.	...	.31	.31	.32½	...	.32½
Spec. Solvent, tks, wks gal.	...	.23½	...	.23½	.19	.23½
Aldehyde ammonia, 100 gal drs lb.	.80	.82	.80	.82	.80	.82
Aldehyde Bisulfite, bbls, delv lb.	...	.17	...	.17	...	.17
Aldol, 95%, 55 and 110 gal, drs, delv lb.	.11	.12	.11	.12	.11	.20
Alphanaphthol, crude, 300 lb bbls lb.	...	.52	...	.52	...	.52
Alphanaphthylamine, 350 lb bbls lb.	...	.32	.32	.34	.32	.34
Alum, ammonia, lump, c-l, bbls, wks 100 lb.	...	3.75	...	3.75	3.40	3.75
delv NY, Phila 100 lb.	...	3.75	...	3.75	3.40	3.75
Granular, c-l, bbls wks 100 lb.	...	3.50	...	3.50	3.15	3.50
Powd, c-l, bbls, wks 100 lb.	...	3.90	...	3.90	3.55	3.90
Chrome, bbls 100 lb.	no prices		6.50	6.75	6.50	6.75
Potash, lump, c-l, bbls, wks 100 lbs.	...	4.00	...	4.00	3.65	4.00
Granular, c-l, bbls, wks 100 lb.	...	3.75	...	3.75	3.40	3.75
Powd, c-l, bbls, wks 100 lb.	...	4.15	...	4.15	3.80	4.15
Soda, bbls, wks 100 lb.	...	3.25	...	3.25	...	3.25
Aluminum metal, c-l, NY 100 lb.	...	18.00	18.00	20.00	...	20.00
Acetate, 20%, bbls lb.	.08	.09	.07½	.09	.07½	.09
Basic powd, bbls, delv lb.	.35	.50	.35	.50	.40	.50
32% basic, bbls, delv lb.	.09½	.12	...	...	...	...
Insoluble basic powder, bbls, delv lb.	...	.40	...	...	...	...
Soluble normal pwdr lb.	...	.22	...	...	...	...
Soluble basic powder lb.	...	.33	...	...	...	...
Chloride anhyd, 99% wks lb.	.08	.12	.08	.12	.06	.12
93%, wks lb.	.05	.08	.05	.08	.05	.08
Crystals, c-l, drs, wks lb.	.06	.06½	.06	.06½	.06	.06¼
Solution, drs, wks lb.	.02¾	.03¼	.02¾	.03¼	.02¾	.03¼
Formate, 30% sol bbls, c-l, delv lb.	...	.13	...	.13	...	.13
Hydrate, 96%, light, 90 lb bbls, delv lb.	.12½	.13	.12½	.13½	.11½	.13
heavy, bbls, wks lb.	.029	.03½	.029	.03½	.029	.03½
Oleate, drs lb.	.17½	.20	.16¾	.20	.16¾	.18½
Palmitate, bbls lb.	.20½	.21½	.20½	.24½	.23	.24½
Resinate, pp., bbls lb.	...	.15	...	.15	...	.15
Stearate, 100 lb bbls lb.	.19	.20	.19	.20	.16	.22½
Sulfate, com, c-l, bgs, wks 100 lb.	...	1.15	...	1.15	...	1.15
c-l, bbls, wks 100 lb.	...	1.35	...	1.35	...	1.35
Sulfate, iron-free, c-l, bags, wks 100 lb.	...	1.60	1.60	1.80	...	1.45
c-l, bbls, wks 100 lb.	...	1.80	1.65	1.80	...	1.65
Aminoazobenzene, 110 lb kgs lb.	...	1.15	...	1.15	...	1.15
Ammonia anhyd fert com, tks lb.	.06	.05½	.04½	.05½	.04½	.05½
Ammonia anhyd, 100 lb cyl lb.	...	.16	...	.16	...	.16
50 lb cyl lb.	...	.22	...	.22	...	.22
26°, 800 lb drs, delv lb.	.02¼	.02½	.02¼	.02½	.02¼	.02½
Aqua 26°, tks, NH cont.	...	.05¼z	.04	.05¼	...	.04z
Ammonium Acetate, kgs lb.	.27	.33	.27	.33	.26	.33
Bicarbonate, bbls, f.o.b. wks 100 lb.	...	5.56	...	5.56	5.15	5.71
Bifluoride, 300 lb bbls lb.	.14½	.16½	.14½	.16½	.14½	.16½
Carbonate, tech, 500 lb bbls lb.	.08	.11	.08	.11	.08	.12
Chloride, White, 100 lb bbls, wks 100 lb.	4.45	...	4.45	4.90	4.45	4.90
Gray, 250 lb. bbls, wks 100 lb.	5.50	5.75	5.50	6.25	5.50	6.25
Lump, 500 lb cks spot lb.	.10½	.11	.10½	.11	.10½	.11
Lactate, 500 lb bbls lb.	.15	.16	.15	.16	.15	.16
Laurate, bbls lb.	...	.23	...	.23	...	.23
Linoleate, 80% anhyd, bbls lb.	...	.12	...	.12	.11	.15
Naphthenate, bbls lb	...	.17	...	.17	...	.17
Nitrate, tech, bbls lb.	...	.0455	...	.0455	.036	.0455
Oleate, drs lb.	...	.14	...	.14	.11	.14
Oxalate, neut, cryst, powd, bbls lb.	.19	.20	.19	.20	.19	.20
Perchlorate, kgs lb.	.17	.19	.17	.19	...	.16
Persulfate, 112 lb kgs lb.	.21	.22	.21	.22	.21	.24
Phosphate, diabasic tech, powd, 325 lb bbls lb.	.07½	.10	.07½	.10	.07½	.10
Ricinoleate, bbls lb.	...	.15	...	.15	...	.15
Stearate, anhyd, bbls lb.	...	.24½	...	.24½	.22	.24½
Paste, bbls lb.	...	.06½	...	.06½	.06½	.08

g Grain alcohol 25c a gal. higher in each case. ** On a delv. basis.
z On a f.o.b. wks. basis.

	Current Market	1940 Low	1940 High	1939 Low	1939 High
Ammonium (continued):					
Sulfate, dom, f.o.b., bulk ton	...	28.00	...	28.00	27.00	28.00
Sulfocyanide, pure, kgs lb.	...	.65	...	.65	.55	.65
Amyl Acetate (from pentane)						
tks, delv lb.	...	.095	...	.095	.095	.10
c-l, drs, delv lb.	...	.105	...	.105	.105	.11
lcl, drs, delv lb.	...	.115	...	.115	.115	.112
tech drs, delv lb.	...	.12½	...	.12½	.10½	.12½
Secondary, tks, delv lb.	...	.08½	...	.08½	...	.08½
c-l, drs, delv lb.	...	.09½	...	.09½	...	.09½
tks, delv lb.	...	.08½	...	.08½	...	.08½
Chloride, norm, drs, wks lb.	.56	.68	.56	.68	.56	.68
mixed, drs, wks lb.	.0565	.0665	.0565	.0665	.0565	.077
tks, wks lb.	...	.0465	...	.0465	.0465	.06
Mercaptan, drs, wks lb.	...	1.10	...	1.10	...	1.10
Oleate, lcl, wks, drs lb.	...	.25	...	.25	...	.25
Stearate, lcl, wks, drs lb.	...	.26	...	.26	...	.26
Amylene, drs, wks lb.	.102	.11	.102	.11	.102	.11
tks, wks lb.	...	.09	...	.09	...	.09
Aniline Oil, 960 lb drs and tks lb.	...	.14½	...	.14½	.14½	.17½
Annatto fine lb.	.34	.39	.34	.39	.34	.39
Anthracene, 80% lb.	...	.55	...	.55	.55	.75
Anthraquinone, sublimed, 125 lb bbls lb.	...	.65	...	.65	...	.65
Antimony metal slabs, ton lots lb.	...	.14	...	.14	.11¼	.14
Butter of, see Chloride.						
Chloride, soln, cbys lb.	...	.17	...	.17	...	.17
Needle, powd, bbls lb.	nom.	.18	...	.18	.12	.20
Oxide, 500 lb bbls lb.	.13	.14	.13	.15¾	.10	.15¾
Salt, 63% to 65%, tins lb.	...	.30	.42	nom.	.25¾	.42
Archil, conc, 600 lb bbls lb.	no prices		no prices		.21	.27
Double, 600 lb bbls lb.	no prices		no prices		.18	.20
Aroclors, wks lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbls lb.	.09½	.10	.09	.10	.08½	.09
Arsenic, Metal lb.	...	...	...	...	.40	.60
Red, 224 lb cs kgs lb.	no prices		.17½	.18	.18	.19
White, 112 lb kgs lb.	.03¼	.04	.03	.03¾	.03	.03¾
B						
Barium Carbonate precip, 200 lb bgs, wks ton	52.50	55.00	52.50	62.50	52.50	62.50
Nat (witherite) 90% gr, c-l, wks, bgs ton	45.00	47.00	45.00	47.00	41.00	47.00
Chlorate, 112 lb kgs, NY lb.	nom.	.26	.20	.26	.16½	.25
Chloride, 600 lb bbls, delv, zone 1 ton	77.00	92.00	77.00	92.00	77.00	92.00
Dioxide, 88%, 690 lb drs lb.	...	.10	.10	.12	.11	.12
Hydrate, 500 lb bbls lb.	.06½	.07	.06½	.07	.04½	.05½
Nitrate, bbls lb.	.08½	.10½	.09½	.10½	.06¾	.10½
Barytes, floated, 350 lb bbls c-l, wks ton	...	25.15	...	25.15	...	23.65
Bauxite, bulk, mines ton	7.00	10.00	7.00	10.00	7.00	10.00
Bentonite, c-l, 325 mesh, bgs, wks ton	...	16.00	...	16.00	...	16.00
200 mesh ton	...	11.00	...	11.00	...	11.00
Benzaldehyde, tech, 945 lb. drs, wks lb.	.55	.60	.55	.60	.60	.62
Benzene (Benzol), 90%, Ind. 8000 gal tks, ft all'd gal.	...	.15	...	.16	...	.16
90% c-l, drs gal.	...	.20	...	.21	...	.21
Ind pure, tks, frt all'd gal.	...	.15	...	.16	...	.16
Benzidine Base, dry, 250 lb bbls lb.	...	.70	...	.70	.70	.72
Benzoyl Chloride, 500 lb drs lb.	.23	.28	.23	.28	.40	.45
Benzyl Chloride, 95-97% rfd. drs lb.	.19	.21	.19	.21	.30	.40
Beta-Naphthol, 250 lb bbls, wks lb.	.23	.24	.23	.24	.23	.24
Naphthylamine, sublimed, 200 lb bbls lb.	1.25	1.35	1.25	1.35	1.25	1.35
Tech, 200 lb bbls lb.	.51	.52	.51	.52	.51	.52
Bismuth metal lb.		1.25	...	1.25	1.05	1.25
Chloride, boxes lb.	3.20	3.25	3.20	3.25	3.20	3.25
Hydroxide, boxes lb.	3.35	3.46	3.35	3.46	3.15	3.40
Oxychloride, boxes lb.	...	3.10	...	3.10	2.95	3.10
Subbenzoate, boxes lb.	...	3.36	3.25	3.36	3.25	3.30
Subcarbonate, kgs lb.	1.73	1.76	1.73	1.76	1.43	1.76
Trioxide, powd, boxes lb.	...	3.56	3.56	3.57	...	3.57
Subnitrate, fibre, drs lb.	1.48	1.51	1.48	1.51	1.23	1.51
Blanc Fixe, 400 lb bbls, wks ton *h*	35.00	42.50	50.00	80.00	40.00	80.00
Beaching Powder, 800 lb drs, c-l, wks, contract 100 lb.	...	2.00	...	2.00	...	2.00
lcl, drs, wks lb.	2.25	3.35	2.25	3.35	2.25	3.60
Blood, dried, f.o.b., NY unit	...	2.25	2.25	3.35	2.50	4.25
Chicago, high grade unit	...	2.50	2.00	3.50	2.30	4.25
Imported shipt unit	...	2.30	2.25	3.30	2.65	3.90
Blues, Bronze Chinese Prussian Soluble lb.	.36	.37	.33	.37	.33	.37
Milori, bbls lb.	.33	.34	.33	.34	.33	.37
Ultramarine,* dry, wks, bbls lb.	...	.11	...	.11	...	.11
Regular grade, group 1 lb.	...	.16	...	.16	...	.16
Special, group 1 lb.	...	.19	...	.19	...	.19
Pulp, No. 1 lb.	.22	.27	.22	.27	...	.27
Bone, 4½ + 50% raw, Chicago ton		30.00	30.00	33.00	27.00	35.00
Bone Ash, 100 lb kgs lb.	.06	.07	.06	.07	.06	.07
Meal, 3% & 50%, imp ton	...	32.50	32.00	32.50	22.00	32.00
Domestic, bgs, Chicago ton	29.00	30.00	29.00	32.00	24.00	32.00
Borax, tech, gran, 80 ton lots, sacks, delv ton *i*	...	43.00	...	43.00	...	43.00
bbls, delv ton *i*	...	53.00	...	53.00	...	53.00

h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; *Freight is equalized in each case with nearest producing point.

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AMERICAN-BRITISH CHEMICAL SUPPLIES, Inc
180 MADISON AVE., NEW YORK, N.Y.

	Current Market	1940 Low	1940 High	1939 Low	1939 High
Borax (continued)					
Tech, powd, 80 ton lots, sacks ton *i*	...	48.00	47.00	48.00	...	47.00
bbs, delv ton *i*	...	58.00	57.00	58.00	...	57.00
Bordeaux Mixture, drs...lb.	.11	.11½	.11	.11½	.11	.11½
Bromine, cases lb.	.25	.30	.25	.43	.30	.43
Bronze, Al, pwd, 300 lb drs lb.	...	.57	...	.57	.90½	.92½
Gold, blk lb.	.60	.65	.60	.65	.45	.65
Butanes, com 16-32° group 3 tks lb.	.02½	.03	.02¼	.03¼	.02¼	.03¼
Butyl, Acetate, norm drs, frt all'd lb.	...	.09	...	.10	.09	.10
tks, frt all'd lb.	...	.08	...	.09	.08	.09
Secondary, tks, frt all'd lb.	...	.06½	...	.06½	.05½	.06½
drs, frt all'd lb.	.07½	.08	.07½	.08	.068	.08
Aldehyde, 50 gal drs, wks lb.	.15½	.17½	.15½	.17½	.15½	.17½
Carbinol, norm (see Normal Amyl Alcohol)						
Crotonate, norm, 55 and 110 gal drs, delv ...lb.	...	.35	...	.35	.35	.75
Lactate lb.	.23½	.24½	.23½	.24½	.22½	.24½
Oleate, drs, frt all'd ..lb.	...	.25	...	.25	...	.25
Propionate, drs lb.	.16½	.17	.16½	.17	.16½	.18½
tks, delv lb.	...	.15½	...	.15½	.15½	.17
Stearate, 50 gal drs ...lb.	...	.28½	...	.28½	.26½	.28½
Tartrate, drs lb.	.55	.60	.55	.60	.55	.60
Butyraldehyde, drs, lcl, wks lb.	...	.35½	...	.35½	...	.35½
C						
Cadmium Metal lb.	.80	.85	.80	.85	.50	.85
Sulfide, orange, boxes .lb.	...	.75	.75	.85	.75	.90
Calcium, Acetate, 150 lb bgs c-l, delv 100 lb.	...	1.90	...	1.90	1.65	1.90
Arsenate, c-l, E of Rockies, dealers, drs lb.	.06	.06½	.06	.07¼	.06¾	.07¼
Carbide, drs lb.	...	.04¾	.05	.06	.05	.06
Carbonate, tech, 100 lb bgs c-l lb.	...	1.00	...	1.00	...	1.00
Chloride, flake, 375 lb drs, burlap bgs, c-l, delv..ton	...	20.50	...	22.00	...	22.00
paper bags, c-l, delv..ton	20.50	35.00	20.50	36.00	23.00	36.00
Solid, 650 lb drs, c-l, delv ton	19.00	35.00	19.00	35.00	...	20.00
Ferrocyanide, 350 lb bbls wks lb.	...	.20	...	.20	...	.20
Gluconate, Pharm, 125 lb bbls lb.	.50	.57	.50	.57	.50	.57
Levulinate, less than 25 bbl lots, wks lb.	...	3.00	...	3.00	...	3.00
Nitrate, 100 lb bags ...ton	nom.	80.00	28.00	29.00	...	28.00
Palmitate, bbls lb.	.22	.24	.22	.24	.22	.23
Phosphate, tribasic, tech, 450 lb bbls lb.	.0635	.0705	.0635	.07½	.06½	.07½
Resinate, precip, bbls...lb.	.13	.14	.13	.14	.13	.14
Stearate, 100 lb bbls...lb.	.20½	.22½	.20½	.22½	.19	.21
Camphor, slabs lb.	.83	.84	.83	.84	.46	.77
Powder lb.	.83	.84	.83	.84	.45	.47
Carbon Bisulfide, 500 lb drs lb.	.05	.05¼	.05	.05¼	.05	.05¼
Black, c-l, bgs, delv, price varying with zone† ...lb.	...	.03	.02¼	.03¼	.02¼	.03¼
lcl, bgs, f.o.b.whse....lb.	...	.065	...	.065	...	.06¼
cartons, f.o.b. whse.....lb.	...	.065	...	.065	...	.06¼
cases, f.o.b. whse.....lb.	...	.07	...	.07	...	.07
Decolorizing, drs, c-l...lb.	.08	.15	.08	.15	.08	.15
Dioxide, Liq 20-25 lb cyl lb.	.06	.08	.06	.08	.06	.08
Tetrachloride, 55 or 110 gal drs, c-l, delv.....lb.	...	.66½	...	.66½	.05	.05½
Casein, Standard, Dom, grd lb.	.13½	.14½	.10	.14½	.07	.23
80-100 mesh, c-l bgs....lb.	.14	.15	.11	.15	.07½	.23½
Castor Pomace, 5½ NH_3, c-l, bgs, wks ton	15.00	...	15.00	17.50	16.50	18.50
Imported, ship, bgs....ton	no prices		...	20.00	18.00	18.00
Celluloid, Scraps, ivory cs lb.	.12	.15	.12	.15	.12	.15
Transparent, cs lb.	...	.20	...	.20	...	.20
Cellulose, Acetate, 50 lb kgs lb.	...	.30	.30	.34	.35	.36
Chalk, dropped, 175 lb bbls lb.	...	.02¾	.02¾	.03¼	.02¾	.03¼
Precip, heavy, 560 lb cks lb.	...	.03¼	.02¾	.03¼	.02¾	.03¼
Light, 250 lb cks lb.	...	.03¼	.03¼	.04	.03¼	.04
Charcoal, Hardwood, lump, blk, wks bu.	...	.15	...	.15	...	.15
Softwood, bgs, delv* ...ton	25.00	36.00	25.00	36.00	23.00	36.00
Willow, powd, 100 lb bbls, wks lb.	.06	.07	.06	.07	.06	.07
Chestnut, clarified, tks, wks lb.	...	.01¾	...	.01¾	...	.01¾
25%, bbls, wks lb.	...	.02½	...	.02½	...	.02
China Clay, c-l, blk mines ton	...	7.60	7.60	9.50	7.00	7.60
Imported, lump, blk...ton	26.00	nom.	...	26.00	22.00	26.00
Chlorine, cyls, lcl, wks, contract lb.	...	.07¼	.07½	.08½	.07½	.08½
cyls, c-l, contract ...lb *j*	...	.05¼	...	.05¼	.05¼	.05½
Liq, tk, wks, contract 100 lb.	...	1.75	...	1.75	1.75	2.00
Multi, c-l, cyls, wks, cont lb.	...	.019	...	.019	1.90	2.15
Chloroacetophenone, tins, wks lb.	3.00	3.50	3.00	3.50	3.00	3.50
Chlorobenzene, Mono, 100 lb drs, lcl, wks lb.	.06	.08	.06	.08	.06	.07½
Chloroform, tech, 1000 lb drs lb.	...	.20	.20	.21	.20	.21
USP, 25 lb tins lb.	.30	.31	.30	.31	.30	.31
Chloropicrin, comml cyls .lb.	...	.80	...	.80	...	.80
Chrome, Green, CP lb.	.21	.25	.21	.25	.21	.25
Yellow lb.	.13½	.14½	.13½	.14½	.13½	.15½
Chromium Acetate, 8% Chrome, bbls lb.	...	.05¾	...	.05¾	.05	.08
Fluoride, powd, 400 lb bbl lb.	.27	.28	.27	.28	.27	.28

i A delivered price; * Depends upon point of delivery; † New bulk price, tank cars ¼c per lb. less than bags in each zone.

	Current Market	1940 Low	1940 High	1939 Low	1939 High
Coal tar, bbls bbl.	7.50	7.75	7.50	8.00	7.50	8.00
Cobalt Acetate, bbls lb.	...	.80½	...	.80½	.65	.71
Carbonate tech, bbls ...lb.	...	1.58	1.38	1.60	1.25	1.63
Hydrate, bbls lb.	...	1.98	...	1.78	...	1.78
Linoleate, solid, bbls ...lb.	...	.33	...	.33	...	.33
paste, 6%, drs lb.	...	.31	...	.31	...	.31
Oxide, black, bgs lb.	...	1.84	...	1.84	1.67	1.84
Resinate, fused, bbls ...lb.	...	.13½	...	.13½	...	.13½
Precipitated, bbls ....lb.	...	.34	...	.34	...	.34
Cochineal, gray or bk bgs lb.	.37	.38	.37	.38	.35	.38
Teneriffe silver, bgs....lb.	.38	.39	.38	.39	.36	.39
Copper, metal, electrol 100 lb.	11.13	11.50	11.15	11.62½	.10	12.50
Acetate, normal, bbls, wks lb.	.22	.24	.22	.24	.21	.24
Carbonate, 52-54% 400 lb. bbls lb.	...	.1610	.1610	.169	.14½	.169
Chloride, 250 lb bbls ...lb.	...	.16	.16	.18	.12½	.18
Cyanide, 100 lb drs ....lb.	...	.34	...	.34	...	.34
Oleate, precip, bbls ....lb.	...	.20	...	.20	...	.20
Oxide, black, bbls, wks lb.	...	.18	.18	.18¾	.15	.18¾
red 100 lb bbls .....lb.	...	.19½	.19½	.20	.15¾	.20
Sub-acetate verdigris, 400 lb bbls lb.	.18	.19	.18	.19	.18	.19
Sulfate, bbls, c-l, wks 100 lb.	...	4.60	4.45	4.60	4.10	4.75
Copperas crys and sugar bulk c-l, wks ton	...	14.00	...	14.00	14.00	16.00
Corn Sugar,tanners,bbls 100 lb.	...	3.31	2.99	3.31	2.89	3.19
Corn Syrup, 42°, bbls 100 lb.	...	3.42	3.02	3.42	2.92	3.17
43°, bbls 100 lb.	...	3.47	3.07	3.47	2.97	3.22
Cotton, Soluble, wet, 100 lb bbls lb.	.40	.42	.40	.42	.40	.42
Cream Tartar, powd & gran 300 lb bbls lb.	...	.34½	.28¼	.34½	.22¼	.25¾
Creosote, USP 42 lb cbys lb.	.45	.47	.45	.47	.45	.47
Oil, Grade 1 tks gal.	.13½	.14	.13½	.14	.13½	.14
Grade 2 gal.	.122	.132	.122	.132	.122	.132
Cresol, USP, drs lb.	.09¾	.10¼	.09¾	.10¼	.09½	.10½
Crotonaldehyde, 97%, 55 and 110 gal drs, wks lb.	.11	.12	.11	.12	.11	.22*
Cutch, Philippine,100 lb bale lb.	...	.04½	.04	.04½	.04	.04½
Cyanamid, pulv, bags, c-l, frt all'd, nitrogen basis, unit	...	1.40	...	1.40	...	1.27½
D						
Derris root 5% rotenone, bbls lb.	.24	.30	.24	.30	.24	.30
Dextrin, corn, 140 lb bgs f.o.b., Chicago ...100 lb.	...	3.80	3.40	3.80	3.30	3.75
British Gum, bgs ...100 lb.	...	4.05	3.65	4.05	3.55	3.95
Potato, Yellow, 220 lb bgs lb.	...	.07¾	...	.07¾	.07	.08¼
White, 220 lb bgs, lcl lb.	.08½	.09	.08½	.09	.08	.09
Tapioca, 200 bgs, lcl ...lb.	...	.0715	...	.0715	...	.0715
White, 140 lb bgs...100 lb.	...	3.75	3.35	3.75	3.25	3.70
Diamylamine, c-l, drs, wks lb.	...	.47	...	.47	...	.47
lcl drs, wks lb.	...	.48	...	.50	...	.50
tks, wks lb.	...	.45	...	.45	...	.45
Diamylene, drs, wks .....lb.	.095	.102	.095	.102	.095	.102
tks, wks lb.	...	.08½	...	.08½	...	.08½
Diamylether, wks, drs ...lb.	.085	.092	.085	.092	.085	.092
tks, wks lb.	...	.075	...	.075	...	.075
Oxalate, lcl, drs, wks..lb.	...	.30	...	.30	...	.30
Diamylphthalate, drs, wks lb.	.21	.21½	.21	.21½	.19	.21
Diamyl Sulfide, drs, wks lb.	...	1.10	...	1.10	...	1.10
Diatomaceous Earth, see Kieselguhr.						
Dibutoxy Ethyl Phthalate, drs, wks lb.	...	.35	...	.35	...	.35
Dibutylamine, lcl, drs, wks lb.	.51	.53	.51	.53	.53	.55
c-l drs, wks lb.	...	.50	...	.50	...	...
tks, wks lb.	...	.48	...	.48	...	...
Dibutyl Ether, drs, wks, lcl lb.	.24½	.25	.24½	.25	.24½	.25
Dibutylphthalate, drs, wks, frt all'd lb.	.19	.19½	.19	.19½	.19	.19½
Dibutyltartrate, 50 gal drs lb.	...	.50	...	.50	.45	.54
Dichlorethylene, drs lb.	...	.25	...	.25	...	.25
Dichloroethylether, 50 gal drs, wks lb.	.15	.16	.15	.16	.15	.16
tks, wks lb.	...	.14	...	.14	...	.14
Dichloromethane, drs, wks lb.	...	.23	...	.23	...	.23
Dichloropentanes, drs, wks lb.	...	.025	...	.025	no prices	
tks, wks lb.	...	.0221	...	.0221	no prices	
Diethanolamine, tks, wks..lb.	...	.22½	...	.22½	.22½	.23
Diethylamine, 400 lb drs, lcl, f.o.b., wks lb.	...	.70	...	.70	.70	3.00
Diethylaniline, 850 lb drs lb.	.40	.52	.40	.52	.40	.52
Diethyl Carbinol, drs ...lb.	.60	.75	.60	.75	.60	.75
Diethylcarbonate, com drs lb.	...	.25	...	.25	.31¾	.35
Diethylorthotoluidin, drs ..lb.	.64	.67	.64	.67	.64	.67
Diethylphthalate, 1000 lb drs lb.	.19	.19½	.19	.19½	.19	.19½
Diethylsulfate, tech, drs, wks, lcl lb.	.13	.14	.13	.14	.13	.14
Diethyleneglycol, drs ...lb.	.14½	.15½	.14½	.15½	.14½	.17
Mono ethyl ethers, drs..lb.	.14½	.15½	.14½	.16	.15	.16
tks, wks lb.	...	.13½	...	.13½	.13½	.14
Mono butyl ether, drs..lb.	.22½	.24½	.22½	.24½	.23	.24
tks, wks lb.	...	.22	...	.22	...	.22
Diethylene oxide, 50 gal drs, wks lb.	.20	.24	.20	.24	.20	.24
Diglycol Laurate, bbls....lb.	...	.16	.16	.21	.15	.23
Oleate, bbls lb.	...	.17	.13	.17	.13	.20
Stearate, bbls lb.	...	.22	.22	.26	.20	.28
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis lb.	...	1.00	...	1.00	...	1.00
Dimethylaniline, 340 lb drs lb.	.23	.24	.23	.24	.23	.24
Dimethyl Ethyl Carbinol,drs lb.	.60	.75	.60	.75	.60	.75
Dimethyl phthalate, drs, wks, frt all'd lb.	...	.18½	...	.18½	...	.19
Dimethylsulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50

k Higher price is for purified material; * These prices were on a delivered basis.

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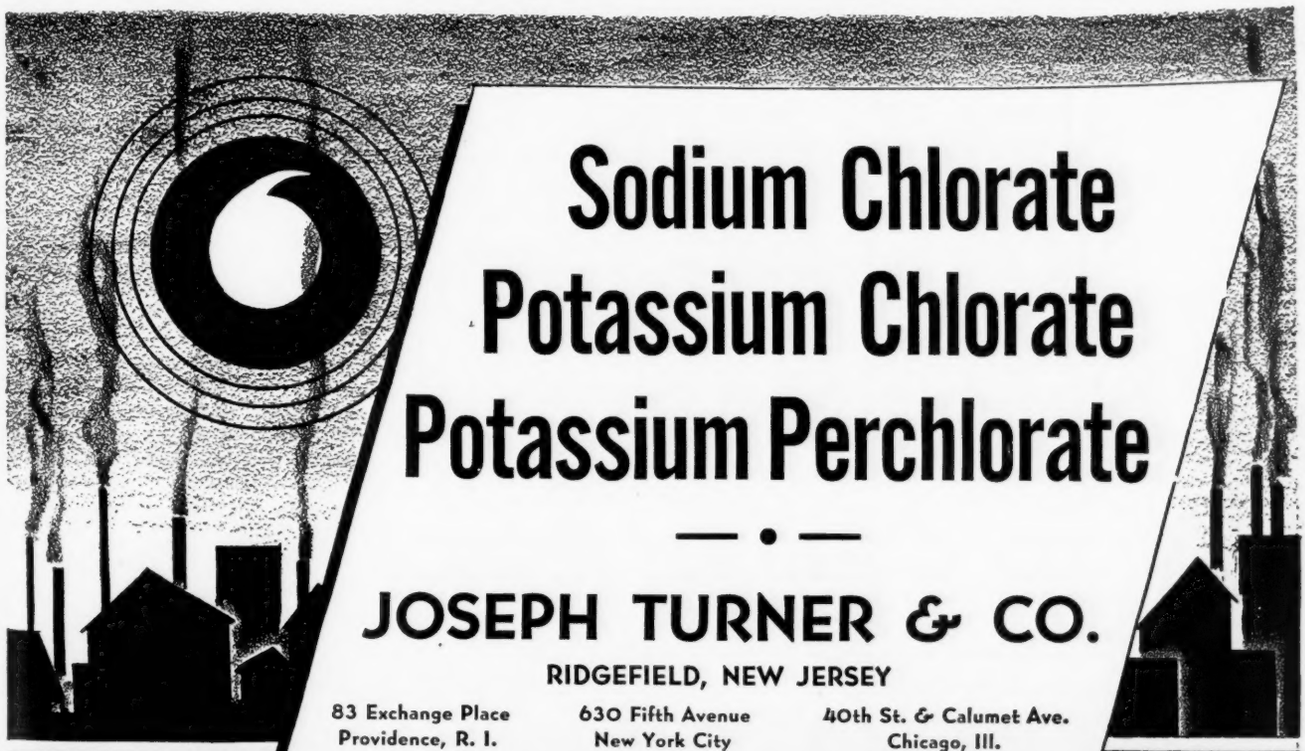

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	Current Market	1940 Low	1940 High	1939 Low	1939 High
Dinitrobenzene, 400 lb bbls lb. *k*	...	.18	.19	.16	.19
Dinitrochlorobenzene, 400 lb bbls lb.	...	.14	.14	.13½	.14
Dinitronaphthalene, 350 lb bbls lb.	.35	.38	.38	.35	.38
Dinitrophenol, 350 lb bbls lb.	...	.22	.23	.22	.24
Dinitrotoluene, 300 lb bbls lb.	...	.15½	.15½	...	.15½
Diphenyl, bbls lb.	.15	.20	.20	.15	.25
Diphenylamine lb.	...	.25	.32	.32	.32
Diphenylguanidine, 100 lb drs lb.	.35	.37	.37	.31	.37
Dip Oil, see Tar Acid Oil.					
Divi Divi pods, bgs shipmt ton	...	nom.	nom.	...	nom.
Extract lb.	.05¾	.06¼	.06¼	.05¾	.06¼
E					
Egg Yolk, dom., 200 lb cases lb.	.59	.62	.62	.59	.69
Epsom Salt, tech, 300 lb bbls c-l, NY 100 lb.	...	1.90	2.10	1.90	2.10
USP, c-l, bbls 100 lb.	...	2.10	2.10	...	2.10
Ether, USP anaesthesia 55 lb drs lb.	...	.26	.26	.22	.23
Isopropyl 50 gal drs lb.	.07	.08	.08	.07	.08
tks, frt all'd lb.	...	.06	.06	...	.06
Nitrous conc bottles lb.	...	.68	.68	...	.68
Synthetic, wks, drs lb.	.08	.09	.09	.08	.09
Ethyl Acetate, 85% Ester tks, frt all'd' lb.	...	.06	.06½	.051	.061
drs, frt all'd lb.	...	.07	.08½	.061	.08
99%, tks, frt all'd lb.	...	.07¼	.08	.0585	.0685
drs, frt all'd lb.	...	.08¼	.08¾	.0685	.0785
Acetoacetate, 110 gal drs lb.	...	.27½	.27½	...	.27½
Benzylaniline, 300 lb drs lb.	.86	.88	.88	.86	.88
Bromide, tech drs lb.	.50	.55	.55	.50	.55
Cellulose, drs, wks, frt all'd lb.	.45	.50	.50	.45	.50
Chloride, 200 lb drs lb.	.18	.20	.20	.22	.24
Chlorocarbonate, cbys lb.	...	.30	.30	...	.30
Crotonate, drs lb.	...	.35	.35	.35	.75
Formate, drs, frt all'd lb.	.25	.26	.24	.27	.28
Lactate, drs, wks lb.	...	.33½	.33½	...	.33½
Oxalate, drs, wks lb.	...	.25	.25	.30	.34
Oxybutyrate, 50 gal drs, wks lb.	1.00	nom.	.30	1.00	.30	.30½
Silicate, drs, wks lb.	...	.77	.77	...	.77
Ethylene Dibromide, 60 lb drs lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont lb.	.75	.85	.75	.85	.75	.85
Anhydrous lb.	...	.75	...	.75	...	.75
Dichloride, 50 gal drs, wks lb.	.0595	.0694	.0595	.0694	.0545	.0994
Glycol, 50 gal drs, wks lb.	.14½	.18½	.14½	.18½	.14½	.21
tks, wks lb.	...	.13½	...	.13½	.13½	.16
Mono Butyl Ether, drs, wks lb.	.16½	.17½	.16½	.21	.16½	.22
tks, wks lb.	...	.15½	...	.15½	.15½	.19
Mono Ethyl Ether, drs, wks lb.	.14½	.15½	.14½	.15½	.14½	.17
tks, wks lb.	...	.13½	...	.13½	.13½	.15
Mono Ethyl Ether Acetate, drs, wks lb.	.11½	.12½	.11½	.13	.11½	.14
tks, wks lb.	...	.10½	...	.10½	.10½	.13
Mono Methyl Ether, drs wks lb.	.15½	.16½	.15½	.17	.16	.22
tks, wks lb.	...	.14½	...	.14½	.14½	.17
Oxide, cyl lb.	.50	.55	.50	.55	.50	.55
Ethylideneaniline lb.	45	.47½	.45	.47½	.45	.47½
F						
Feldspar, blk pottery ton	17.00	19.00	17.00	19.00	17.00	19.00
Powd, blk wks ton	14.00	17.50	14.00	17.50	14.00	14.50
Ferric Chloride, tech, crys, 475 lb bbls lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys lb.	.06½	.07	.06¼	.07	.06¼	.06½
Fish Scrap, dried, unground wks unit *l*	...	3.60	3.60	4.25	3.00	4.25
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis unit *m*	...	3.50	3.00	3.50	2.35	3.00
Fluorspar, 98% bgs lb.	...	32.60	...	32.60	30.00	33.00
Formaldehyde, USP, 400 lb bbls, wks lb.	.055	.06	.05¾	.06¼	.05¾	.06¼
Fossil Flour lb.	.02½	.04	.02½	.04	.02½	.04
Fullers Earth, blk, mines ton	...	15.00	...	15.00	10.00	11.00
Imp powd, c-l, bgs ton	no prices		...	25.00	23.00	30.00
Furfural (tech) drs, wks lb.	.10	.15	.10	.15	.10	.15
Furfuramide (tech) 100 lb drs lb.	...	.30	...	.30	...	.30
Fusel Oil, 10% impurities lb.	.16	.17¼	.16	.17¼	.12½	.17¼
Fustic, crystals, 100 lb boxes lb.	.24	.25	.24	.28	.22	.28
Liquid 50°, 600 lb bbls lb.	.10½	.14	.10½	.14	.09½	.14
Solid, 50 lb boxes lb.	.19	.21	.19	.21	.17½	.21
G						
G Salt paste, 360 lb bbls lb.	...	.45	.45	.47	.45	.47
Gambier, com 200 lb bgs lb.	...	.07	...	.07	.06¼	.07¼
Singapore cubes, 150 lb bgs 100 lb.	...	.09	.09	.10	.08	.10
Gelatine, tech, 100 lb cs lb.	.42	.43	.42	.43	.42	.50
Glauber's Salt, tech, c-l, bgs, wks* 100 lb.	.95	1.18	.95	1.18	.95	1.18
Anhydrous, see Sodium Sulfate						

l + 10; m + 50; * Bbls. are 20c higher.

	Current Market		1940 Low	1940 High	1939 Low	1939 High
Glue, bone, com grades, c-l bgs ..... lb.	.13½	.15	.13½	.15½	.13½	.15½
Better grades, c-l, bgs lb.	.15	.23	.15	.23	.11½	.15½
Glycerin, CP, 550 lb drs lb.	...	.12½	...	.12½	...	.12½
Dynamite, 100 lb drs ... lb.	...	nom.	...	nom.	...	.09
Saponification, drs ..... lb.	...	.13	...	.13	.08½	.10
Soap Lye, drs ..... lb.	.07¾	.08¼	.07¾	.08¼	.07½	.07⅞
Glyceryl Bori-Borate, bbls lb.	...	.40	...	.40	...	.40
Monoricinoleate, bbls ... lb.	...	.27	...	.27	...	.27
Monostearate, bbls ..... lb.	...	.30	...	.30	...	.30
Oleate, bbls ..... lb.	...	.22	...	.22	...	.22
Phthalate ..... lb.	...	.38	.37	.38	...	.37
Glyceryl Stearate, bbls ... lb.	...	.18	...	.18	.24	.27½
Glycol Bori-Borate, bbls.. lbs.	...	.22	...	.22	.22	.23
Phthalate, drs ..... lb.	...	.38	...	.38	.38	.40
Stearate, drs ..... lb.	...	.26	...	.26	...	.26
GUMS						
Gum Aloes, Barbadoes ... lb.	.80	.85	.80	.90	.85	.90
Arabic, amber sorts ... lb.	.14	.15	.08½	.15	.09	.24
White sorts, No. 1, bgs lb.	.35	.36	.28	.36	.23	.35
No. 2, bgs ..... lb.	no prices		.27	.34	.21	.34
Powd, bbls ..... lb.	.18	.20	.12½	.20	.12½	.27
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b. NY ..... lb.	.04½	.05½	.02½	.10½	.02½	.10½
California, f.o.b. NY, drs ton	29.00	36.50	29.00	36.50	29.00	55.00
Egyptian, 200 lb cases, f.o.b. NY ..... lb.	.12	.15	.12	.15	.12	.15
Benzoin Sumatra, USP, 120 lb cases ..... lb.	.18	.20	.17	.24	.17	.34
Copal, Congo, 112 lb bgs, clean, opaque ..... lb.	...	.29½	.	.29½	.18¼	.29½
Dark amber ..... lb.	...	.12⅜	.11⅜	.12⅜	.07⅛	.11⅜
Light amber ..... lb.	...	.17	...	.17	.11¼	.17
Copal, East India, 180 lb bgs						
Macassar pale bold .... lb.	...	.13⅞	.13⅞	.15⅝	.11⅜	.15¼
Chips ..... lb.	...	.07½	.07½	.09	.05⅜	.08½
Dust ..... lb.	...	.05¼	.04¾	.06¾	.03¼	.07⅛
Nubs ..... lb.	...	.11⅛	.11⅛	.14⅜	.09½	.13¾
Singapore, Bold ..... lb.	...	.15¾	.14⅝	.17½	.14	.18¼
Chips ..... lb.	...	.08½	.08½	.09⅛	.05⅝	.10¼
Dust ..... lb.	...	.05¼	.04¾	.06¾	.03¼	.07⅛
Nubs ..... lb.	...	.11	.11	.13½	.09⅝	.14⅜
Copal Manila, 180-190 lb	...	.13⅞	.13¾	.16¾	.09¾	.14½
Loba B ..... lb.	...	.13¾	.13½	.16⅛	.09	.14⅛
Loba C ..... lb.	...	.13½	.12⅛	.14½	.07⅞	.12½
DBB ..... lb.	...	.12⅛	.06⅞	.12⅛	.05⅛	.08¼
MA sorts ..... lb.	...	.09	.09	.13¾	.05⅞	.11
Copal Pontianak, 224 lb cases, bold genuine .. lb.	...	.15⅜	.15⅛	.18½	.15¼	.18½
Chips ..... lb.	...	.10	.08⅜	.10½	.07⅛	.11½
Mixed ..... lb.	...	.14⅜	.14⅛	.16⅝	.13⅜	.16⅝
Nubs ..... lb.	...	.12¾	.10¾	.13½	.10½	.14⅜
Split ..... lb.	...	.13¾	.13½	.16⅛	.12	.16⅛
Damar Batavia, 136 lb cases						
A ..... lb.	...	.21⅝	.21⅝	.22¼	.20	.23¼
B ..... lb.	...	.20¼	.20⅛	.21⅛	.18½	.21⅛
C ..... lb.	...	.14⅝	.15⅝	.15¼	.13½	.15⅝
D ..... lb.	...	.13¼	.13¼	.13¾	.12¼	.14¼
A/D ..... lb.	...	.13⅞	.13⅞	.14½	.12¾	.15¼
A/E ..... lb.	...	.12⅞	.12⅞	.13⅜	.11⅜	.13¾
E ..... lb.	...	.10	.10	.10⅜	.07⅜	.10
F ..... lb.	...	.08	.08	.08¾	.07¼	.08¾
Singapore, No. 1 ..... lb.	...	.16⅝	.16⅝	.19⅝	.13¼	.19½
No. 2 ..... lb.	...	.12¼	.12¼	.15¾	.10½	.16⅜
No. 3 ..... lb.	...	.07⅞	.07⅞	.09	.05¼	.09⅛
Chips ..... lb.	...	.11	.11	.12½	.09¼	.12½
Dust ..... lb.	...	.07⅛	.07⅛	.09	.05¼	.09⅛
Seeds ..... lb.	...	.09⅞	.09⅞	.10½	.07⅜	.10½
Elemi, cns, c-l ..... lb.	...	.10½	.10⅛	.11⅝	.08⅛	.12⅝
Ester ..... lb.	.06¼	.06¾	.06¼	.06¾	.06	.07
Gamboge, pipe, cases .... lb.	.75	.80	.70	.75	.55	.80
Powd, bbls ..... lb.	.80	.85	.75	.80	.60	.85
Ghatti, sol, bgs ..... lb.	.11	.15	.11	.15	.11	.15
Karaya, bbls, bxs, drs ... lb.	.14	.33	.14	.33	.14	.33
Kauri, NY						
Brown XXX, cases .... lb.	...	.60	...	60	.60	.60½
BX ..... lb.	...	.38	...	.38	...	.38
B1 ..... lb.	...	.28	...	.28	...	.28
B2 ..... lb.	...	.24	...	.24	...	.24
B3 ..... lb.	...	.18½	...	.18½	...	.18½
Pale XXX ..... lb.	...	.61	...	.61	...	.61
No. 1 ..... lb.	...	.41	...	.41	...	.41
No. 2 ..... lb.	...	.24	...	.24	...	.24
No. 3 ..... lb.	...	.17¾	...	.17¾	...	.17¾
Kino, tins ..... lb.	4.00	4.50	4.00	4.50	2.50	4.50
Mastic ..... lb.	nom.	1.15	.85	.90	.55	.90
Sandarac, prime quality, 200 lb bgs & 300 lb cks... lb.	.40	.45	.35	.37	.15	.37
Senegal, picked bags ..... lb.	...	.30	...	.30	.25	.30
Sorts ..... lb.	...	.13	...	.13	.09¼	.13
Thus, bbls ..... 280 lbs.	15.00	15.25	15.00	15.25	13.50	15.25
Tragacanth, No. 1, cases.. lb.	no prices		2.65	2.70	2.25	2.50
No. 2 ..... lb.	no prices		2.55	2.60	1.90	2.40
No. 3 ..... lb.	no prices		2.45	2.50	1.60	2.25
Yacca, bgs ..... lb.	.03½	.04	.03½	.04	.03½	.08
H						
Helium, cyl (200 cu. ft.) cyl.	..	25.00	...	25.00	...	25.00
Hematine crystals, 400 lb bbls lb.	.20	.30	.20	.30	.20	.34
Hemlock, 25%, 600 lb bbls. wks ..... lb.	...	.03⅛	.03⅛	.03⅜	.03	.03⅜
tks ..... lb.	...	.02¾	.02¾	.03	.02⅝	.02¾
Hexalene, 50 gal drs, wks lb.	...	.30	...	.80	...	.30

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		Current Market	1940 Low	1940 High	1939 Low	1939 High
Hexane, normal 60-70° C. Group 3, tks	gal.	...	.10½	...	.10½	...	.10½
Hexamethylenetetramine, powd, drs	lb.	.32	.33	.32	.33	.32	.36
Hexyl Acetate, secondary, delv, drs	lb.	.13	.13½	.13	.13½	.13	.13½
tks	lb.	...	.12	...	.12	...	.12
Hoof Meal, f.o.b. Chicago unit		2.25	2.40	2.50	3.15	2.50	3.25
Hydrogen Peroxide, 100 vol. 140 lb cbys	lb.	...	.20	...	.20	.19½	.20
Hydroxylamine Hydrochloride	lb.	...	3.15	...	3.15	...	3.15
Hypernic, 51°, 600 lb bbls	lb.	...	.14	...	.14	.13	.21
Indigo, Bengal, bbls	lb.	1.63	1.67	1.63	1.67	...	2.40
Synthetic, liquid	lb.	.16½	.19	.16½	.19	.16½	.19
Iodine, Resublimed, jars	lb.	...	2.50	...	2.50	1.75	2.00
Irish Moss, ord, bales	lb.	.15	.16	.15	.16	.10	.10
Bleached, prime, bales	lb.	.30	.32	.28	.32	.19	.20
Iron Acetate Liq. 17°, bbls delv	lb.	.03	.04	.03	.04	.03	.04
Chloride see Ferric Chloride.							
Nitrate, coml, bbls. 100	lb.	2.75	3.00	2.75	3.00	2.32	3.11
Isobutyl Carbinol (128-132° C) drs, frt all'd	lb.	...	.22½	.22½	.34	.33	.34
tks, frt all'd	lb.	...	.21½	.21½	.32	...	.32
Isopropyl Acetate, tks, frt all'd	lb.	...	.06	.05½	.06	.051	.06
drs, frt all'd	lb.	.07	.07½	.06½	.07½	.061	.07
Ether, see Ether, isopropyl.							
Keiselguhr, dom bags, c-l, Pacific Coast	ton	22.00	35.00	22.00	35.00	22.00	35.00

L

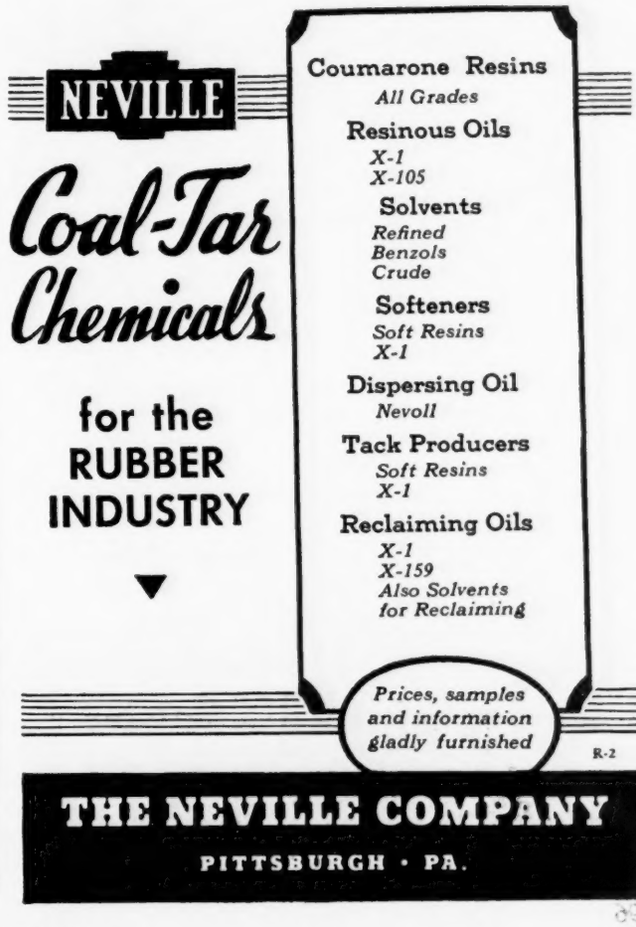
Lead Acetate, f.o.b. NY, bbls, White, broken	lb.	...	.11	...	.11	.10	.11
cryst, bbls	lb.	...	.11	...	.11	.10	.11
gran, bbls	lb.	...	.11¼	...	.11¼	.10¼	.11¼
powd, bbls	lb.	...	.11¼	...	.11¼	.10¼	.11¼
Arsenate, East, drs	lb.	...	.08½	.08½	.11	.10	.11½
Linoleate, solid, bbls	lb.	...	.19	...	.19	...	.19
Metal, c-l, NY	100 lb.	5.00	5.05	5.00	5.25	4.75	5.55
Nitrate, 500 lb bbls, wks	lb.	.11	.14	.11	.14	.10	.12
Oleate, bbls	lb.	.18½	.20	.18½	.20	.18½	.20
Red, dry, 95% Pb_3O_4, delv	lb.	...	.07¼	.07½	.08	.07¼	.08½
97% Pb_3O_4, delv	lb.	...	.0765	.0765	.08¼	.07½	.0835
98% Pb_3O_4, delv	lb.	...	.08½	.08	.08¾	.07¾	.0860
Resinate, precip, bbls	lb.	...	.16½	...	.16½	...	.16½
Stearate, bbls	lb.	...	.25	...	.26	.22	.25
Titanate, bbls, c-l, f.o.b. wks, frt all'd	lb.	.10	.10¼	.10	.10¼	.11	.11½
White, 500 lb bbls, wks,	lb.	...	.07¼	.07	.07¼	...	.07
Basic sulfate, 500 lb bbls, wks	lb.	...	.06½	.06¼	.06½	...	.06¼
Lime, chemical quicklime, f.o.b., wks, bulk	ton	7.00	13.00	7.00	13.00	7.00	8.00
Hydrated, f.o.b. wks	ton	8.50	16.00	8.50	16.00	8.50	12.00
Lime Salts, see Calcium Salts							
Lime, sulfur, dealers, tks	gal.	...	.08½	.07½	.11½	.08	.11½
drs	gal.	.11	.15	.11	.16	.11	.16
Linseed Meal, bgs	ton	...	24.50	24.50	37.00	34.00	42.00
Litharge, coml, delv, bbls	lb.	.06¾	.07	.06½	.06¾	.06¼	.071
Lithopone, dom, ordinary, delv, bgs	lb.	...	.036	...	.036	.03¾	.04¼
bbls	lb.	...	.0385	.03¾	.03¾	.04	.04⅛
High strength, bgs	lb.	...	.05	...	.05	.05¼	.05¼
bbls	lb.	...	.05¼	...	.05¼	.05½	.05⅞
Titanated, bgs	lb.	...	.05	...	.05	.05¼	.05¼
bbls	lb.	...	.05¼	...	.05¼	.05½	.05⅞
Logwood, 51°, 600 lb bbls	lb.	.10½	.12½	.10½	.12½	.09½	.12½
Solid, 50 lb boxes	lb.	.16½	.20½	.16½	.20½	.15	.20½

M

Madder, Dutch	lb.	.22	.25	.22	.25	.22	.25
Magnesite, calc, 500 lb bbls	ton	60.00	65.00	58.00	66.00	58.00	66.00
Magnesium Carb, tech, 70 lb bgs, wks	lb.	...	.06¼	...	.06¼	.05¾	.06½
Chloride flake, 375 lb bbls, c-l, wks	ton	...	32.00	32.00	42.00	39.00	42.00
Fluosilicate, crys, 400 lb bbls, wks	lb.	.10	.10½	.10	.10½	.10	.10½
Oxide, calc tech, heavy bbls, frt all'd	lb.	...	.26	.25	.30	.25	.30
Light bbls above basis	lb.	...	.26	.20	.26	.20	.25
USP Heavy, bbls, above basis	lb.	...	.26	.25	.30	.25	.30
Palmitate, bbls	lb.	.33	nom.	.33	nom.	.33	nom.
Silicofluoride, bbls	lb.	.11	.11½	.11	.11½	.09½	.11½
Stearate, bbls	lb.	.24	.27	.24	.27	.21	.24
Manganese, acetate, drs	lb.	...	.26½	...	.26½	...	.26½
Borate, 30%, 200 lb bbls	lb.	.15	.16	.15	.16	.15	.16
Chlorate, 600 lb cks	lb.	...	.08½	...	.08½	.07½	.12
Dioxide, tech (peroxide), paper bags, c-l	ton	...	62.50	62.50	66.50	47.50	66.50
Hydrate, bbls	lb.	...	.82	...	.82	...	.32
Linoleate, liq, drs	lb.	.18	.19½	.18	.19½	.18	.19¼
solid, precip, bbls	lb.	...	.19	...	.19	...	.19
Resinate, fused, bbls	lb.	.08¼	.08½	.08¼	.08½	.08¼	.08½
precip, drs	lb.	...	.12	...	.12	...	.12
Sulfate, tech, anhyd, 90-95%, 550 lb drs	lb.	.09	.09½	.08	.09½	.07	.08½
Mangrove, 55%, 400 lb bbls	lbs.	...	...	...	...	...	.04
Bark, African	ton	...	39.50	30.00	39.50	23.00	35.00

	Current Market	1940 Low	1940 High	1939 Low	1939 High
Mannitol, pure cryst, cs, wks lb.	...	.90	.90	1.00	.95	1.20
commercial grd, 250 lb bbls ..... lb.	.38	.45	.38	.50	.42	.57
Marble Flour, blk ..... ton	12.00	14.00	12.00	14.00	12.00	14.00
Mercury chloride (Calomel) lb.	...	2.95	2.45	2.95	1.36	2.57
Mercury metal ..76 lb. flasks	190.00	192.00	190.00	228.50	95.00	170.00
Mesityl Oxide, f.o.b. dest., tks ..... lb.	...	.15	...	.15	.10½	.15
drs, c-l ..... lb.	...	.16	...	.16	.11½	.16
drs, lcl ..... lb.	...	.16½	...	.16½	.12	.16½
Meta-nitro-aniline ..... lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls ..... lb.	1.05	1.10	1.05	1.40	1.30	1.55
Meta-phenylene diamine 300 lb bbls ..... lb.	...	.65	...	.65	.80	.84
Meta-toluene-diamine 300 lb bbls ..... lb.	...	.65	.65	.67	.65	.67
Methanol, denat, grd, drs, c-l frt all'd ..... gal.	...	.45	...	.45	.41	.46
tks, frt all'd ..... gal.	...	.40	...	.40	.35	.40
Pure, drs, c-l, frt all'd' gal.	...	.35½	.35	.38	...	.38
tks ..... gal.	...	.30	.30	.33	...	.33
95%, tks ..... gal.	...	.29	.28	.31	...	.31
97%, tks ..... gal.	...	.30	.29	.32	...	.32
Methyl Acetate, tech tks, delv ..... lb.	.06	.07	.06	.07	.06	.06½
55 gal drs, delv ..... lb.	.07	.08	.07	.08	.07	.08
C.P. 97-99%, tks, delv lb.	.09½	10½	.09½	.10½	...	.06¼
55 gal drs, delv ..... lb.	.10½	.11½	.10½	.11½	.07¼	.07¼
Acetone, frt all'd, drs gal. ♦	...	.37½	.41	.44	.30	.44
tks, frt all'd ..... gal. ♦	...	.32	.35	.39	.25	.35
Synthetic, frt all'd, east of Rocky M., drs ..... gal. ♦	...	.36	.36	.44	.38	.41
tks, frt all'd ..gal.	...	.34	.34	.36	...	.31½
West of Rocky M., frt all'd, drs..gal. ♦	...	.48	.42	.48	...	.42
tks, frt all'd...gal. ♦	...	.45½	.35	.45½	...	.35
Anthraquinone ..... lb.	...	.83	...	.83	...	.83
Butyl Ketone, tks ..... lb.	...	.10½	...	.10½	...	.10½
Cellulose, 100 lb lots, frt all'd ..... lb.	...	.70	...	.70	...	...
less than 100 lbs. f.o.b. wks ..... lb.	...	.75	...	.75	...	...
Chloride, 90 lb. cyl ..... lb.	.32	.40	.32	.40	.32	.40
Ethyl Ketone, tks, frt all'd lb.	...	.06	.05½	.06	.05	.05½
50 gal drs, frt all'd' c-l lb	.07	.07½	.06½	.07½	.06	.07
Formate, drs, frt all'd..lb.	...	.89	...	.89	.35	.39
Hexyl, Ketone, pure, drs lb.	...	.60	...	.60	...	.60
Lactate, drs, frt all'd...lb.	...	.80	...	.80	...	.30
Mica, dry grd, bgs, wks..ton	...	30.00	...	30.00	...	30.00
Michler's Ketone, kgs ...lb.	...	2.50	...	2.50	...	2.50
Monoamylamine, c-l, drs, wks lb.	...	.52	...	.52	...	.52
lcl, drs, wks ..... lb.	.53	.55	.53	.55	...	...
tks, wks ..... lb.	...	.50	...	.50	...	...
Monobutylamine, drs, c-l, wks ..... lb.	...	.50	...	.50	.50	.65
lcl, wks ..... lb.	.51	.53	.51	.53	...	...
tks, wks ..... lb.	...	.48	...	.48	...	...
Monochlorobenzene, see "C"						
Monoethanolamine, tks, wks lb.	...	.23	...	.23	...	.23
Monoethylamine (100% basis) lcl, drs, f.o.b. wks ....lb.	...	.65	...	.65	...	...
Monomethylamine, drs, frt all'd, E Mississippi, c-l lb.	...	.65	...	.65	...	.65
Monomethylparamiosulfate, 100 lb drs ..... lb.	3.75	4.00	3.75	4.00	3.75	4.00
Morpholine, drs 55 gal, lcl wks ..... lb.	...	.75	...	.75	...	...
Myrobalans 25%, liq bbls lb.	no prices		no prices		.03¾	.04¼
50% Solid, 50 lb boxes lb.	no prices		no prices		.04¾	.05
J1 bgs ..... ton	...	40.00	28.50	40.00	24.00	50.00
J2 bgs ..... ton	...	34.00	23.00	34.00	19.00	41.00
N						
Naphtha, v.m.&p. (deodorized) see petroleum solvents.						
Naphtha, Solvent, water-wht, tks ..... gal.	...	.27	...	.27	.26	.27
drs, c-l ..... gal.	...	.32	...	.32	.31	.32
Naphthalene, dom, crude bgs. wks ..... lb.	2.25	2.75	2.25	2.75	2.25	2.85
imported, cif, bgs ...lb.	no prices		...	3.00	1.50	1.85
Balls, flakes, pks ..... lb.	.06¼	.07¾	.06¼	.07¾	.06½	.07½
Balls, ref'd, bbls, wks..lb.	...	.07	.06¾	.07	.05¾	.06¾
Flakes, ref'd, bbls, wks lb.	...	.07	.06¾	.07	.05¾	.06¾
Nickel Carbonate, bbls...lb.	.36	.36½	.36	.36½	.36	.37½
Chloride, bbls ..... lb.	.18	.20	.18	.20	.18	.20
Metal ingot ..... lb.	...	.35	...	.35	...	.35
Oxide, 100 lb kgs, NY lb.	.35	.38	.35	.38	.35	.37
Salt, 400 lb bbls, NY lb.	.13	.13½	.13	.13½	.13	.13½
Single, 400 lb bbls, NY lb.	.13	.13½	.13	.13½	.13	.13½
Nicotine, 40%, drs, sulfate, 55 lb drs ..... lb.	...	.70	...	.70	.70	.76
Nitre Cake, blk ..... ton	...	16.00	...	16.00	...	16.00
Nitrobenzene redistilled, 1000 lb drs, wks ..... lb.	.08	.09	.08	.10	.08	.10
tks ..... lb.	...	.07	...	.07	.07	.07½
Nitrocellulose, c-l, lcl, wks lb.	.20	.29	.20	.29	.22	.29
Nitrogen Sol. 45½% ammon, f.o.b. Atlantic & Gulf ports, tks, unit ton, N basis	...	1.2158	...	1.2158		1.2158
Nitrogenous Mat'l, bags imp unit	no prices		2.20	2.60	2.25	2.85
dom, Eastern wks ...unit	...	2.20	2.20	2.90	2.30	3.00
dom. Western wks ...unit	...	1.75	1.95	2.00	1.90	2.25
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Alleppo, bgs ...lb.	.26	.29	.29	.30	.22	.23

a Country is divided in 4 zones, prices varying by zone; ♦ Country is divided into 4 zones. Also see footnote directly above; q Naphthalene quoted on Pacific Coast F.A.S. Phila., or N. Y.



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Oak Bark Extract
Phloroglucinol

Prices

	Current Market	1940 Low	1940 High	1939 Low	1939 High
Oak Bark Extract, 25%, bbls lb.	.03¼	.03¼	.03¼	.03¼	.03½
tks lb.	...	.02¾	...	.02¾	.02¾
Octyl Acetate, tks, wks lb.	...	.15	...	.15	.15	.17
Orange-Mineral, 1100 lb cks NY lb.	.10¾	.11¾	.10½	.12	.10¼	.10¾
Orthoaminophenol, 50 lb kgs lb.	2.15	2.25	2.15	2.25	2.15	2.25
Orthoanisidine, 100 lb drs lb.	...	.70	.70	.74	.70	.74
Orthochlorophenol, drs ... lb.	...	.32	...	.32	...	.32
Orthocresol, 30.4°, drs, wks lb.	.16	.16½	.16	.16½	.14½	.17½
Orthodichlorobenzene, 1000 lb drs lb.	.06	.07	.06	.07	.06	.07
Orthonitrochlorobenzene, 1200 lb drs, wks lb.	.15	.18	.15	.18	.15	.18
Orthonitroparachlorphenol, tins lb.	...	.75	...	.75	...	.75
Orthonitrophenol, 350 lb drs lb.	.85	.90	.85	.90	.85	.90
Orthonitrotoluene, 1000 lb drs, wks lb.	...	.09	...	.09	.08	.10
Orthotoluidine, 350 lb bbls, lcl lb.	...	.19	...	.19	.16	.19
Osage Orange, cryst, bbls lb.	...	.21	...	.21	.17	.25
51° liquid lb.	...	.10	...	.10	.07	.09
P						
Paraffin, rfd, 200 lb bgs 122-127° M P lb.	.03¼	.057	.03¼	.0675	.03¾	.06¾
128-132° M P lb.	.057	.095	.057	.0705	.04	.0705
133-137° M P lb.	.06¼	.07¼	.06¼	.0755	.0465	.0755
Para aldehyde, 99%, tech, 110-55 gal drs, wks lb.	.10	.11¼	.10	.11¼	.10	.16*
Aminoacetanilid, 100 lb kgs lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs lb.	...	.32	...	.32	.30	.45
Dichlorobenzene 200 lb drs, wks lb.	.11	.12	.11	.12	.11	.12
Formaldehyde, drs, wks lb.	.34	.35	.34	.35	.34	.35
Nitroacetanilid, 300 lb bbls lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wk lb.	...	.47	...	.47	.45	.47
Nitrochlorobenzene, 1200 lb drs, wks lb.	...	.15	.15	.16	.15	.16
Nitro-orthotoluidine, 300 lb bbls lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	...	.35	.35	.37	.35	.37
Nitrosodimethylaniline, 120 lb bbls lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	...	.30	...	.30	.30	.35
Phenylenediamine, 350 lb bbls lb.	1.25	1.30	1.25	1.30	1.25	1.30
Toluenesulfonamide, 175 lb bbls lb.	...	.70	.70	.75	.70	.75
tks, wks lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks lb.	...	.48	.48	.50	.48	.58
Paris Green, dealers, drs lb.	.23	.26	.23	.26	.23	.26
Pentane, normal, 28-38° C, group, 3 tks gal.	...	.08½	...	.08½	...	.08½
drs, group 3 gal.	.11½	.16	.11½	.16	.11½	.16
Perchlorethylene, 100 lb drs, frt all'd lb.	.08	.08½	.08	.08¾	.08	.10½
Petrolatum, dark amber, bbls lb.	...	.02¾	.02¾	.05	.02⅝	.05
White, lily, bbls lb.	...	.04¾	.04¾	.08½	.05¼	.08½
White, snow, bbls lb.	...	.05½	.05½	.09½	.06¼	.09½
Petroleum Ether, 30-60°, group 3, tks gal.	...	.13½	...	.13½	.13	.13½
drs, group 3 gal.	.14½	.25½	.14½	.25½	.14	.25½
PETROLEUM SOLVENTS AND DILUENTS						
Cleaners naphthas, group 3, tks, wks gal.	.06⅞	.07	.06⅞	.07	.06⅜	.07
East Coast, tks wks gal.	.09	.10½	.09	.10½	.09	.10
Lacquer diluents, tks, East Coast gal.	.09½	.10	.09½	.10	.09	.12½
Group 3, tks gal.	...	.07⅞	...	.07⅞	.07⅜	.08
Naphtha, V.M.P., East tks, wks gal.	.09½	.10	.09½	.10	.09	.10
Group 3, tks, wks gal.	...	.06⅞	.06⅜	.07⅞	.06⅜	.07
Petroleum thinner, 43-47, East, tks, wks gal.	.08¾	.09½	.08¾	.09½	.08½	.10
Group 3, tks, wks gal.	...	.05⅞	.05⅞	.07	.05⅜	.06
Rubber Solvents, stand grd, East, tks, wks gal.	...	.09½	...	.09½	.09	.10
Group 3, tks, wks gal.	.06⅞	.07	.06⅞	.07	.06⅜	.07
Stoddard Solvents, East, tks, wks gal.	.08¾	.09½	.08¾	.09½	.08½	.10
Group 3, wks gal.	.06⅜	.06½	.06⅜	.06½	.05⅞	.06½
Phenol, 250-100 lb drs lb.	.13	.14¾	.13	.14¾	.13	.15½
tks, wks lb.	...	.12	...	.12	.12	.13½
Phenyl-Alpha-Naphthylamine, 100 lb kgs lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs lb.	...	.17	...	.17	...	.17
Phenylhydrazine Hydrochloride, com lb.	...	1.50	...	1.50	...	1.50
Phloroglucinol, tech, tins lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tons lb.	20.00	22.00	20.00	22.00	20.00	22.00

* These prices were on a delivered basis.

	Current Market	1940 Low	1940 High	1939 Low	1939 High
Phosphate Rock, f.o.b. mines					
70% basis ton	...	2.15	1.85	1.90	...	1.85
72% basis ton	...	2.40	2.15	2.35	...	2.35
Florida Pebble, 68% basis ton	...	1.90	1.90	2.85	...	2.85
75-74% basis ton	...	2.90	2.90	3.85	...	3.85
75% basis ton	...	5.50	...	5.50	...	5.50
Tennessee, 72% basis ton	...	4.50	...	4.50	...	4.50
Phosphorus Oxychloride 175 lb cyl lb.	.15	.18	.15	.20	.16	.20
Red, 110 lb cases lb.	.40	.44	.40	.44	.40	.44
Sesquisulfide, 100 lb cs. lb.	.38	.42	.38	.44	.38	.44
Trichloride, cyl lb.	.15	.16	.15	.18	.15	.18
Yellow, 110 lb cs, wks lb.	.18	.20	.18	.20	.24	.30
Phthalic Anhydride, 100 lb drs, wks lb.	.14½	.15½	.14½	.15½	...	.14½
Pine Oil, 55 gal drs or bbls						
Destructive dist lb.	.50	.55	.53	.56	.46	.48
Steam dist wat wh bbls gal.	..	.59	...	.59	...	.59
tks gal.	...	54	...	.54	...	.54
Pitch Hardwood, wks ton	23.75	24.00	23.75	24.00	23.75	24.00
Coaltar, bbl, wks ton	...	19.00	...	19.00	...	19.00
Burgundy, dom, bbls, wks lb.	.05½	.06½	.05½	.06½	.05½	.06½
Imported lb.	no prices		no prices		.15	.16
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls bbl.	6.00	6.50	6.00	6.50	6.00	6.25
Platinum, ref'd oz.	35.00	38.00	35.00	40.00	32.00	40.00
POTASH						
Potash, Caustic, wks, sol. lb.	.06¼	.06¾	.06¼	.06¾	.06¼	.06½
flake lb.	.07	.07½	.07	.07½	.07	.07⅜
liquid, tks lb.	...	.02⅞	.02⅞	.03¾	...	.02⅞
Manure Salts, imported 30% basis, blk unit	no prices		...	.58½	...	.58½
Potassium Abietate, bbls lb	...	.08	.08	.09	...	.09
Acetate, tech, bbls, delv lb.	...	.26	...	.26	...	.26
Bicarbonate, USP, 320 lb bbls lb.	no prices		...	.18	...	.18
Bichromate Crystals, 725 lb cks* lb.	.08⅞	.09¼	.08¾	.09¼	.08¾	.09¼
Binoxalate, 30 lb bbls lb.	...	.23	...	.23	...	.23
Bisulfate, 100 lb kgs lb.	.15½	.18	.15½	.18	.15½	.18
Carbonate, 80-85% calc 800 lb cks lb.	.06½	.06¾	.06½	.07	.06½	.07
liquid, tks lb.		.0275	.0275	.03	...	.02⅞
drs, wks lb.	.03	.03⅛	.03	.03½	.03	.03½
Chlorate crys, 112 lb kgs, wks lb.	.10½	.17	.10½	.13	.09¼	.13
gran, kgs lb.	.12	.14½	.12	.14½	.12	.14½
powd, kgs lb.	.10	.17	.10	.12½	.08½	.12½
Chloride, crys, bbls lb.	.04	nom.	.04	.04¾	.04	.04¾
Chromate, kgs lb.	.24	.27	.24	.27	.19	.28
Cyanide, 110 lb cases lb.	no prices		no prices		.50	.55
Iodide, 250 lb bbls lb.	..	1.35	...	1.35	1.13	1.35
Metabisulfite, 300 lb bbls lb.	nom.	.15	.13	.15	.11	.18
Muriate, bgs, dom, blk unit		.53½	...	.53½	...	.53½
Oxalate, bbls lb.	.25	.26	.25	.26	.25	.26
Perchlorate, kgs, wks lb.	.09½	.11	.09½	.11	.09	.10½
Permanganate, USP, crys, 500 & 1000 lb drs, wks lb.	.18½	.19	.18½	.19½	.18½	.19½
Prussiate, red, bbls lb.	nom.	.45	.38	.45	.30½	.45
Yellow, bbls lb.	.17	.19	.15	.16	.14	.16
Sulfate, 90% basis, bgs ton	...	36.25	...	36.25	36.25	38.00
Titanium Oxalate, 200 lb bbls lb.	.40	.45	.40	.45	.35	.45
Pot & Mag Sulfate, 48% basis bgs ton	no prices		...	24.75	24.75	25.75
Propane, group 3, tks lb.	.03¾	.04	.03	.04⅛	.03	.04⅛
Putty, com'l, tubs 100 lb.	...	3.15	...	6.00	3.00	6.00
Linseed Oil, kgs 100 lb.	...	5.00	...	4.50	...	4.50
Pyrethrum, conc liq:						
2.4% pyrethrins, drs, frt all'd gal.	7.15	7.50	7.15	7.50	5.75	7.50
3.6% pyrethrins, drs, frt all'd gal.	10.65	11.00	10.65	11.00	8.45	11.00
Flowers, coarse, Japan, bgs lb.	.33	.36	.33	.36	.26	.36
Fine powd, bbls lb.	.35	.37	.35	.37	.27	.37
Pyridine, denat, 50 gal drs gal.	...	1.71	...	1.71	1.63	1.71
Refined, drs lb.	...	.51	...	.51	.50	.51
Pyrites, Spanish cif Atlantic ports, blk unit	.12	.13	.12	.13	.12	.13
Pyrocatechin, CP, drs, tins lb.	2.15	2.40	2.15	2.40	2.15	2.75
Q						
Quebracho, 35% liq tks lb.	...	.03½	.03¼	.03½	.02⅞	.03½
450 lb bbls, c-l lb.	...	.04	...	.04	.04	.04⅛
Solid, 63%, 100 lb bales cif lb.	...	.04½	...	.04½	.04	.04½
Clarified, 64% bales lb.	...	.04¾	...	.04¾	.04¼	.04¾
Quercitron, 51 deg liq, 450 lb bbls lb.	.08½	.09½	.08½	.09½	.07½	.08½
Solid, drs lb.	.11	.16½	.10	.16½	.10	.12
R						
R Salt, 250 lb bbls, wks lb.	...	.55	...	.55	.	.55
Resorcinol, tech, cans lb.	.68	.70	.75	.80	.75	.80
Rochelle Salt, cryst lb.	.25¾	.26¼	.22¼	.23¼	.17¾	.21¾
Powd, bbls lb.	.24¾	.25¼	.21¾	.22¼	.16¾	.20¼
Rosin Oil, bbls, first run gal.	.45	.50	...	.50	.45	.47
Second run gal.	.51	.56	.52	.56	.47	.49
Third run, drs gal.	.52	.57	.56	.57	.51	.53
Rosins 600 lb bbls, 100 lb unit ex. yard NY:***						
B	...	1.80	...	1.80	4.60	5.45
D	...	1.87	...	1.87	4.95	5.70
E	...	1.95	...	1.95	5.20	6.40
F	...	2.10	...	2.10	5.50	6.75
G	...	2.10	...	2.10	5.75	7.00
H	...	2.10	...	2.10	5.75	7.10
I	...	2.10	...	2.10	5.77½	7.20

* Spot prices are ⅛c higher; *** July 31, 1939, high and low based on 280 lb. unit.

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BENZENE MONOSULFONIC ACID

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(3,3,3′3′ Tetramethyl-5,6,5′6′-Tetrahydroxy-1,1′-Spiro-Bis Indane)

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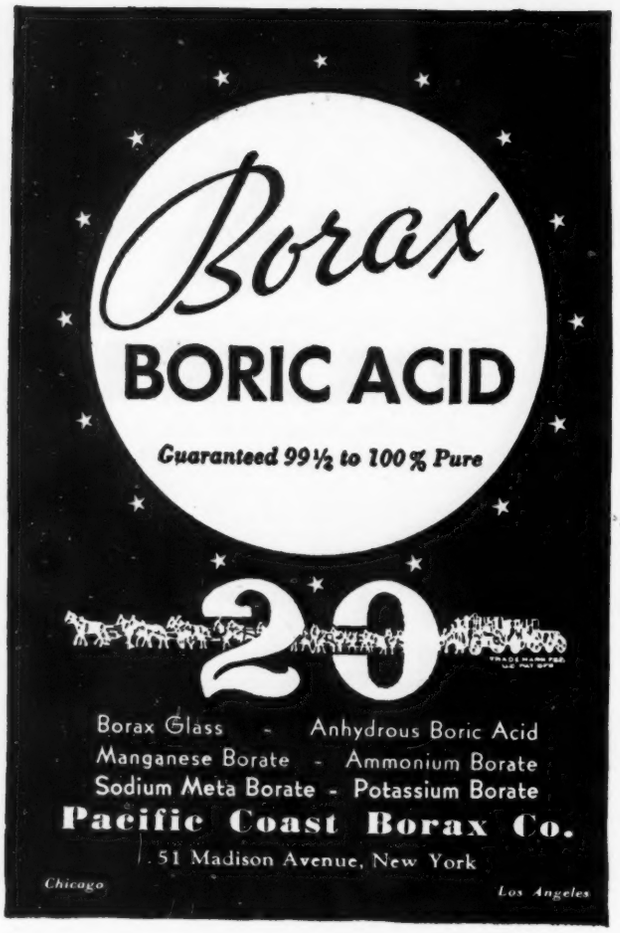

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HYDROFLUORIC ACID

Aqueous and anhydrous

FLUORINE COMPOUNDS

THE HARSHAW CHEMICAL CO.

Cleveland, Ohio, and Principal Cities

		Current Market	1940 Low	1940 High	1939 Low	1939 High
Rosins (continued)						
K	...	2.12	...	2.12	5.80	7.20
M	...	2.21	...	2.21	5.90	7.25
N	...	2.39	...	2.39	6.75	7.40
WG	...	2.68	...	2.68	6.95	7.70
WW	...	3.00	...	3.00	7.45	8.50
Rosins, Gum, Savannah (280 lb unit):**						
B	...	1.15	...	1.15	3.25	4.00
D	...	1.22	...	1.22	3.55	4.30
E	...	1.30	...	1.30	3.80	5.00
F	...	1.45	...	1.45	4.00	5.35
G	...	1.45	...	1.45	4.40	5.70
H	...	1.45	...	1.45	4.40	5.70
I	...	1.45	...	1.45	4.40	5.80
K	...	1.47	...	1.47	4.40	5.80
M	...	1.56	...	1.56	4.40	5.85
N	...	1.74	...	1.74	5.10	6.00
WG	...	2.03	...	2.03	5.60	6.30
WW	...	2.25	...	2.25	6.05	7.10
X	...	2.35	...	2.35	5.60	7.10
Rosin, Wood, c-l, FF grade, NY	3.25	3.65	3.25	6.95	5.35	6.80
Rotten Stone, bgs mines ton	25.50	37.50	25.50	37.50	22.50	37.50
Imported, lump, bbls...lb.	no prices		...	.14	...	.14
Powdered, bbls .....lb.	no prices		.08½	.10	.08½	.10
S						
Sago Flour, 150 lb bgs..lb.	.04	nom.	.04	.04½	.02½	.04½
Sal Soda, bbls wks...100 lb.	...	1.20	...	1.20	...	1.20
Salt Cake, 94-96%, c-l. bulk wks .....ton	...	17.00	...	17.00	19.00	25.00
Chrome, c-l, wks .....ton	...	16.00	11.00	16.00	11.00	12.00
Saltpetre, gran, 450-500 lb bbls .....lb.	...	.071	...	.071	.06½	.069
Cryst, bbls .....lb.	...	.081	...	.081	.07½	.0865
Powd, bbls .....lb.	..	.081		.081	.07½	.079
Satin, White, pulp, 550 lb bbls .....lb.	.01¼	.01½	.01¼	.01½	.01¼	.01½
Schaeffer's Salt, kgs .....lb.	...	.46	.46	.48	.46	.48
Shellac, Bone dry, bbls..lb. *s*	.25	.26	.25	.26	.18	.26
Garnet, bgs .....lb.	...	.19½	.19	.23	.12½	.20
Superfine bgs .....lb. *s*	.14½	.18	.14½	.20½	.10	.21
T. N., bgs .....lb. *s*	.14	.17	.13½	.19½	.09½	.20
Silver Nitrate, vials .....oz.	...	.26⅞	.26⅞	.27⅜	.26⅞	.33½
Slate Flour, bgs, wks....ton	9.00	10.00	9.00	10.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks .....100 lb.	...	1.10	...	1.10	...	1.10
58% light, bgs .....100 lb.	1.05	1.08	1.05	1.08	...	1.08
blk .....100 lb.	...	.90	...	.90	...	.90
paper bgs .....100 lb.	...	1.05	...	1.05	...	1.05
bbls .....100 lbs.	..	1.35	...	1.35	...	1.35
Caustic, 76% grnd & flake, drs .....100 lb.	...	2.70	...	2.70	...	2.70
76% solid, drs.....100 lb.	...	2.30	...	2.30	2.10	2.30
Liquid sellers, tks...100 lb.	...	1.95	1.95	1.97½	...	1.97½
Sodium Abietate, drs ....lb.	...	.11	...	.11	...	.11
Acetate, 60% tech, gran. powd, flake, 450 lb bbls wks .....lb.	.04	.05	.04	.05	.04	.05
90%, bbls, 275 lb delv lb.	.06	.06¾	.06	.06¾	...	...
anhyd, drs, delv .....lb.	...	.08½	.09	.08¼	.10	.08¼
Alginate, drs .....lb.	.71	.96	.71	.96	.70	.95
Antimoniate, bbls .....lb.	.14½	.15	.14½	.15	.11½	.16
Arsenate, drs .....lb.	.07	.08¾	.07	.08¾	.08	.08½
Arsenite, liq, drs ....gal.	...	.35	...	.35	.30	.35
Dry, gray, drs, wks..lb.	.06½	.09¼	.06½	.09½	.07½	.09½
Benzoate, USP kgs ...lb.	.46	.50	.46	.52	.46	.48
Bicarb, powd, 400 lb bbl, wks .....100 lb.	...	1.70	1.70	1.85	...	1.85
Bichromate, 500 lb cks, wks* .....lb.	.06⅞	.07¼	.06¾	.07¼	.06¾	.07¼
Bisulfite, 500 lb bbls, wks lb.	.03	.031	.03	.031	.031	.036
35-40% sol bbls,wks 100 lb.	1.30	1.80	1.40	1.80	1.40	1.80
Chlorate, bgs, wks .....lb.	...	.06¼	.06¼	.08½	.06¼	.07½
Cyanide, 96-98%, 100 & 250 lb drs, wks .....lb.	.14	.15	.14	.15	.14	.15
Diacetate, 33-35% acid, bbls, lcl, delv .....lb.	.08½	.09	.08½	.09	...	.09
Fluoride, white 90%, 300 lb bbls, wks .....lb.	.07	.08	.07	.08	.07	.08¾
Hydrosulfite, 200 lb bbls, f.o.b. wks .....lb.	.16	.17	.16	.17	.16	.17
Hyposulfite, tech, pea crys 375 lb bbls, wks 100 lb.	...	2.80	2.80	3.05	...	2.80
Tech, reg cryst, 375 lb bbls, wks .....100 lb.	2.45	...	2.45	2.80	2.45	2.80
Iodide, jars .....lb.	...	2.42	2.30	2.42	...	2.30
Metanilate, 150 lb bbls..lb	.41	nom.	.41	.42	.41	.42
Metasilicate, gran, c-l, wks .....100 lb.	...	2.35	...	2.35	2.20	2.35
cryst, drs, c-l, wks 100 lb.	...	3.05	...	3.05	2.90	3.05
Monohydrated, bbls ...lb.	...	.023	...	.023	...	.023
Naphthenate, drs .....lb.	.12	.19	.12	.19	.12	.19
Naphthionate, 300 lb bbl lb.	...	.50	...	.50	.50	.54
Nitrate, 92% crude, 200 lb bgs, c-l, NY .....ton	...	28.30	...	28.30	...	28.30
100 bgs, same basis .ton	...	29.00	...	29.00	...	29.00
Bulk .....ton	...	27.00	...	27.00	...	27.00
Nitrite, 500 lb bbls ....lb.	.06¾	.11½	.06¾	.11½	.06¾	.11½
Othochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25	.27	.25	.27	.25	.27
Orthosilicate, 300 lb drs, c-l .....lb.	...	.03	...	.03	...	.03
Perborate, drs, 400 lb ..lb.	.14¾	.15¼	.14¾	.15¼	.14¾	.15¼
Peroxide, bbls, 400 lb ..lb.	...	.17	...	.17	...	.17

r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b. N. Y.; refined 6c higher in each case; *s* T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y. *Spot price is ⅛c higher. ** July 31, 1939, high and low based on 280 lb. unit.

	Current Market	1940 Low	1940 High	1939 Low	1939 High
Sodium (continued):					
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	...	2.30	...	2.30	2.05	2.30
bgs, wks .....100 lb.	...	2.10	...	2.10	1.85	2.10
Tri-sodium, tech, 325 lb. bbls, wks .....100 lb.	...	2.45	...	2.45	2.20	2.45
bgs, wks .....100 lb.	...	2.25	...	2.25	2.00	2.25
Picramate, 160 lb kgs..lb.	...	.65	.65	.67	.65	.67
Prussiate, Yellow, 350 lb. bbls, wks .....lb.	.09½	.09¾	.09½	.09¾	.09½	.10¾
Pyrophosphate, anhyd, 100 lb bbls f.o.b. wks frt eq lb.	...	.0530	...	.0530	...	.0530
Sesquisilicate, drs, c-l, wks .....100 lb.	...	2.90	...	2.90	2.80	2.90
Silicate, 60°, 55 gal drs, wks .....100 lb.	1.40	1.80	1.40	1.80	1.65	1.70
40°, 55 gal drs, wks 100 lb	...	.80	...	.80	...	.80
tks, wks .....100 lb.	...	.65	...	.65	...	.65
Silicofluoride, 450 lb bbls NY .....lb.	no prices		no prices		.03½	.04¾
Stannate, 100 lb drs ...lb.	no prices		.31½	.34½	.30	.35
Stearate, bbls .....lb.	.19	.24	.19	.24	.19	.24
Sulfanilate, 400 lb bbls lb.	.16	.18	.16	.18	.16	.18
Sulfate, Anhyd, 550 lb bgs c-l, wks .....100 lb. ‡	1.45	1.65	1.45	1.90	1.45	1.90
Sulfide, 80% cryst, 440 lb. bbls, wks .....lb.	.02¼	.03	.02¼	.03	.02¼	.02½
Solid, 650 lb drs, c-l, wks .....lb.	.03	.03¾	.03	.03¾	.03	.03½
Sulfite, powd, 400 lb bbls wks .....lb.	...	.05¼	.023	.05¼	.023	.02½
Sulfocyanide, drs .....lb.	.28	.47	.28	.47	.28	.47
Sulforicinoleate, bbls....lb.	...	.12	...	.12	...	.12
Supersilicate (see sodium sesquisilicate)						
Tungstate, tech, crys, kgs lb.	no prices		no prices		1.05	1.10
Sorbitol, com, solut, wks c-l, drs, wks .....lb.	...	.14¾	.14¾	.16	...	.15½
Spruce, Extract, ord, tks..lb.	...	.01⅝	...	.01⅝	...	.01⅝
Ordinary, bbls .....lb.	...	.01⅝	...	.01⅝	...	.01⅝
Super spruce ext, tks...lb.	...	.01¾	...	.01¾	...	.01¾
Super spruce ext, bbls..lb.	...	.01⅞	...	.01⅞	...	.01⅞
Super spruce ext. powd, bgs .....lb.	...	.04	...	.04	...	.04
Starch, Pearl,140 lb bgs100 lb.	...	2.90	2.50	2.80	2.40	2.85
Powd, 140 lb bgs ...100 lb.	...	3.00	2.60	2.90	2.50	2.90
Potato, 200 lb bgs .....lb.	.06½	.07½	.05	.07½	.04	.06¾
Imp, bgs .....lb.	no prices		...	.06½	.05	.06½
Rice, 200 lb bbls .....lb.	.07½	.08½	.07¼	.08½	.06¼	.07¼
Sweet Potato, 240 lb bbls, f.o.b. plant .....100 lb.	nom.	6.75	5.50	6.75	5.50	7.50
Wheat, thick, bgs .....lb.	...	.05¼	.05¼	.05½	.05	.05½
Strontium, carbonate, 600 lb bbls, wks .....lb.	no prices		.22	.23	.16	.24
Nitrate, 600 lb bbls, NY lb.	.07¾	.08¾	.07¾	.08¾	.07¾	.08¼
Sucrose, octa-acetate, den, grd, bbls, wks .....lb.	...	.45	...	.45	...	.45
tech, bbls, wks .....lb.	...	.40	...	.40	...	.40
Sulfur, crude, f.o.b. mines ton	...	16.00	...	16.00	...	16.00
Flour, com'l, bgs ...100 lb.	1.60	1.95	1.60	2.35	1.65	2.35
bbls .....100 lb.	1.95	2.70	1.95	2.70	1.95	2.70
Rubbermakers, bgs..100 lb.	...	2.00	2.00	2.80	2.20	2.80
bbls .....100 lb.	...	2.35	2.35	3.15	2.55	3.15
Extra fine, bgs .....100 lb.	...	2.35	2.85	3.00	2.85	3.00
Superfine, bgs .....100 lb.	2.65	2.80	2.65	2.80	2.65	2.80
bbls .....100 lb.	2.25	3.10	2.25	3.10	2.25	3.10
Flowers, bgs .....100 lb.	3.00	3.75	3.00	3.75	3.00	3.75
bbls .....100 lb.	3.35	4.10	3.35	4.10	3.35	4.10
Roll, bgs .....100 lb.		2.35	2.35	3.10	2.35	3.10
bbls .....100 lb.	2.50	3.25	2.50	3.25	2.50	3.25
Sulfur Chloride, 700 lb drs, wks .....lb.	.03	.08	.03	.08	.03	.04
Sulfur Dioxide, 150 lb cyl lb.	.07	.09	.07	.09	.07	.09
Multiple units, wks ....lb.	.04½	.07	.04½	.07	.04½	.07
tks, wks .....lb.	.04	.06	.04	.06	.04	.05
Refrigeration, cyl, wks lb.	.16	.40	.16	.40	.16	.17
Multiple units, wks ...lb.	.07½	.10	.07½	.10	.07½	.10
Sulfuryl Chloride .....lb.	.15	.40	.15	.40	.15	.40
Sumac, Italian, grd .....ton	no prices		98.00	140.00	65.50	85.00
Extract, 42°, bbls .....lb.	.06	.06¼	.06	.06¼	.05¼	.06¼
Superphosphate, 16% bulk, wks .....ton	...	8.50	8.50	9.00	8.00	9.00
Run of pile .....ton	...	8.00	8.00	8.50	7.50	8.50
Triple, 40-48%, a.p.a. bulk, wks, Balt. unit .....ton	...	.68	.68	.70	...	.70
T						
Talc, Crude, 100 lb bgs, NY ton	14.00	16.00	14.00	15.00	13.00	15.00
Ref'd 100 lb bgs, NY ton	15.25	17.25	14.00	17.25	14.00	16.00
French, 220 lb bgs, NY ton	no prices		23.00	35.00	23.00	30.00
Ref'd, white bgs, NY ton	no prices		45.00	60.00	45.00	60.00
Italian, 220 lb bgs to arr ton	no prices		64.00	70.00	60.00	70.00
Ref'd', white bgs, NY ton	no prices		65.00	78.00	65.00	70.00
Tankage, Grd, NY ...unit ¤	...	2.35	2.35	3.25	2.75	3.25
Ungrd .....unit ¤	...	2.35	2.35	3.25	2.75	5.00
Fert grade, f.o.b.Chgounit ¤	...	2.20	2.20	3.50	2.50	4.50
South American cif unit ¤	...	2.50	2.50	3.50	3.00	4.00
Tapioca Flour, high grade, bgs .....lb.	.03	.05	.02¾	.05	.01¾	.05½
Tar Acid Oil, 15%, drs..gal.	.22	.24	.22	.24	.21	.24
25% drs .....gal.	.25	.27	.25	.28	.25	.28
Tar, pine, delv, drs.....gal.	.26	.27	.26	.27	.25	.27
tks, delv, E. cities ....gal.	...	.21	...	.21	.20	.21
Tartar Emetic, tech, bbls lb.	.34¼	nom.	.34¼	.35	.27¾	.35
USP, bbls .....lb.	.40	nom.	...	.40	.33	.40
Terpineol, den grade, drs lb.	...	.17	...	.17	...	.17
Tetrachlorethane, 650 lb drs lb.	.08	.08½	.08	.08½	.08	.08½
Tetrachlorethylene, drs, tech lb.	.08	.09	.08	.09½	...	.09½
Tetralene 50 gal drs, wks lb.	...	.18	.12	.18	.12	.13
Thiocarbanilid, 170 lb bbls lb.	...	.24	.20	.25	.20	.25

‡ Bags 15c lower; ¤ + 10.

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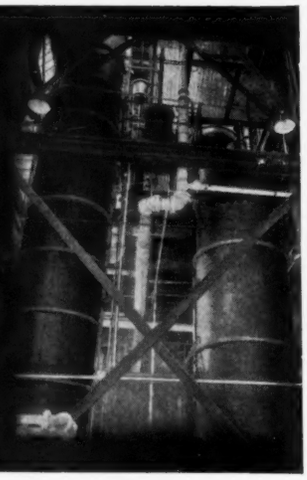

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Tin
Zein

Prices

	Current Market	1940 Low	1940 High	1939 Low	1939 High
Tin, crystals, 500 lb bbls, wks lb.	no prices	.36	.40½	.35½	.39
Metal, NY lb. *	...	.52⅝	.45½	.55	.45½ .60
Oxide, 300 lb bbls, wks lb.	...	.55	.51	.55	.50 .54
Tetrachloride, 100 lb drs, wks lb.	...	.25¾	.23	.26½	.23 .32
Titanium Dioxide, 300 lb bbls lb.	.13¼	.14	.13	.16	.13¼ .16
Barium Pigment, bbls lb.	.05¼	.06½	.05¼	.06½	.05⅜ .06½
Calcium Pigment, bbls lb.	.05¼	.06¼	.05	.06¼	.05⅜ .06½
Titanium tetrachloride, drs. f.o.b. Niagara Falls lb.	.32	.45	.32	45	.32 .45
Titanium trichloride 23% sol. bbls f.o.b. Niagara Falls lb.	.22	.26	.22	.26	.22 .26
20% solution, bbls lb.	.175	.215	.175	.215	.175 .215
Toluidine, mixed, 900 lb drs, wks lb.	..	.26	.26	.27	.26 .27
Toluol, 110 gal drs, wks gal.	...	.32	.27	.32	... .27
8000 gal tks, frt all'd gal.	...	.27	.22	.27	... .22
Toner Lithol, red, bbls lb.	.55	.60	.55	.60	.55 .80
Para, red, bbls lb.	.70	.75	.70	.75	.70 .80
Toluidine, bgs lb.	...	1.05	1.05	1.35	... 1.35
Triacetin, 50 gal drs, wks, lb.	...	.26	...	.26	... .26
Triamyl Borate, lcl, drs, wks lb.	...	.27	...	.27	... .27
Triamylamine, c-l, drs, wks lb.	...	.77	...	.77	.77 1.25
lcl, wks, drs lb.	.78	.80	.78	.80	... ...
tks, wks lb.	...	.75	...	.75	... ...
Tributylamine, lcl, drs, wks lb.	.68	.70	.68	.70	... .70
c-l, drs, wks lb	...	.67	...	.67	... ...
tks, wks lb.	...	.65	...	.65	... ...
Tributyl citrate, drs, frt all'd lb.	.24	.26	.24	.35	.35 .45
Tributyl Phosphate, frt all'd lb.	...	.42	...	.42	... .42
Trichlorethylene, 600 lb drs, frt all'd E. Rocky Mts lb.	.08	.09	.08	.09	.08 .09½
Tricresyl phosphate, tech, drs, lb.	.22	.36½	.22	.36½	.22 .37½
Triethanolamine, 50 gal drs wks lb.	...	.19	.19	.22	.21 .22
tks, wks lb.	...	.18	.18	.20	... .20
Triethylamine, lcl, drs, f.o.b. wks lb.	...	1.05	...	1.05	... ...
Triethylene glycol, drs, wks lb.	...	.26	...	.26	... .26
Trihydroxyethylamine Oleate, bbls lb.	...	.30	...	.30	... .30
Stearate bbls lb.	...	.30	...	.30	... .30
Trimethyl Phosphate, drs, lcl, f.o.b. dest lb.	...	.50	...	.50	... .50
Trimethylamine, c-l, drs, frt all'd E. Mississippi lb.	...	1.00	...	1.00	... 1.00
Triphenylguanidine, lb.	.58	.60	.58	.60	.58 .60
Triphenyl Phosphate, drs lb.	...	.38	...	.38	... .38
Trinoli, airfloated, bgs, wks ton	...	26.00	26.00	30.00	26.00 30.00
Turpentine (Spirits), c-l, NY dock, bbls gal.	...	.32¾*	.32½	.40	.29 .35
Savannah, bbls gal.	...	.20¾*	.26½	.34	.23½ .29
Jacksonville, bbls gal.	no prices		.26	.34¼	.23½ .26¼
Wood Steam dist, drs, c-l, NY gal.	...	.27*	.27	.34½	.242 .34
Wood, dest dist, l-c-l, drs, delv E. cities gal.	...	.30*	.23	.31	.22 .25
U					
Urea, pure 112 lb cases lb.	..	.12	.12	.15½	.14½ .15½
Fert grade, bgs, c. i. f. S.A. points ton	no prices		...	110.00	95.00 110.00
Dom f.o.b., wks ton	...	85.00	85.00	101.00	95.00 101.00
Urea Ammonia, liq., nitrogen basis ton	...	121.50	...	121.50	... ...
V					
Valonia beard, 42%, tannin bgs ton	...	56.00	47.00	56.00	45.00 57.00
Cups, 32% tannin bgs ton	42.00	44.00	33.00	39.00	27.00 39.00
Extract, powd, 63% lb.	.0565 nom.		.0565	.06	.05 .06
Vanillin, ex eugenol, 25 lb tins, 2000 lb lots lb.	...	2.60	...	2.60	2.20 2.60
Ex-guaiacol lb.	...	2.50	...	2.50	2.10 2.50
Ex-lignin lb.		2.50	...	2.50	2.10 2.50
Vermilion, English, kgs lb.	no prices		...	2.76	1.50 2.97
W					
Wattle Bark, bgs ton	37.50	39.50	34.00	38.75	34.50 40.00
Extract, 60°, tks, bbls lb.	...	.03⅞	.03⅞	.04¼	.04 .05½
Wax, Bayberry, bgs lb.	.22	.23	.25	.30	.16⅞ .39
Bees, bleached, white 500 lb slabs, cases lb.	...	.35	.35	.38	.33 .40½
Yellow, African, bgs lb.	.23	.23½	.23	.28	.18½ .30
Brazilian, bgs lb.	.24	.24½	.24	.29	.21 .33
Refined, 500 lb slabs, cases lb.	.29	.31	.29	.36	.25½ .36
Candelilla, bgs lb.	.18½	.19	.18	.19	.15¼ .19
Carnauba, No. 1, yellow, bgs lb.	.58	.59	.58	.85	.36¾ .78
No. 2, yellow, bgs lb.	.57	.58	.57	.84	.35¾ .45
No. 2, N. C., bgs lb.	.52	.53	.46	.73	.34 .41
No. 3, Chalky, bgs lb.	.44	.44½	.43	.66	.27½ .46
No. 3, N. C., bgs lb.	.45	.45½	.47	.68	.28¾ .49
Ceresin, dom, bgs lb.	.11½	.12	.11½	.15	.08½ .15
Japan, 224 lb cases lb.	.15½	.16	.15½	.16½	.09¾ .18
Montan, crude, bgs lb.	no prices		no prices		.11 .11¼
Paraffin, see Paraffin Wax.					
Spermaceti, blocks, cases lb.	.22	.23	.22	.25	.18 .25
Cakes, cases lb.	.23	.24	.23	.25	.19 .26
Whiting, chalk, com 200 lb bgs, c-l, wks ton	16.00	20.00	12.00	20.00	12.00 14.00
Gilders, bgs, c-l, wks ton	...	18.00	15.00	18.50	... 15.00
Wood Flour, c-l, bgs ton	24.00	25.00	20.00	30.00	20.00 30.00
Xylol, frt all'd, East 10° tks, wks gal.	...	.29	...	.30	.29 .30
Com'l tks, wks, frt all'd, gal	...	.26	...	.27	.26 .27
Xylidine, mixed crude, drs lb.	.35	.36	.35	.36	.35 .36
Zein, bgs, 1000 lb lots, wks lb.	...	.20	...	.20	... ...

* July 31. ‡ May 31.

		Current Market		1940 Low	1940 High	1939 Low	1939 High
Zinc Acetate, tech, bbls, lcl, delv	lb.	.15	.16	.15	.16	.15	.21
Arsenite, bgs, frt all'd	lb.	...	.12	.12	.12½	.12	.13
Carbonate tech, bbls, NY	lb.	.14	.16	.14	.16	.14	.15
Chloride fused, 600 lb drs, wks	lb.	...	.04¼	.04¼	.046	.04¼	.046
Gran, 500 lb drs, wks	lb.	...	.05	.05	.05¼	.05	.05¼
Soln 50%, tks, wks 100	lb.	...	2.25	...	2.25	...	2.25
Cyanide, 100 lb drs	lb.	...	.33	...	.33	...	.33
Dust, 500 lb bbls, c-l, delv	lb.	...	.08¼	.07½	.08¼	.06½	.08½
Metal, high grade slabs, c-l, NY	100 lb.	...	6.64	5.90	6.64	4.84	6.40
E. St. Louis	100 lb.	...	6.25	4.60	6.25	4.60	6.00
Oxide, Amer, bgs, wks	lb.	.06¼	.07½	.06¼	.07½	.06¼	.07½
French 300 lb bbls, wks	lb.	.06¼	.07½	.06¼	.07¼	.06½	.07¼
Palmitate, bbls	lb.	.24½	.27½	.23	.27½	.23	.25
Resinate, fused, pale bbls	lb.	...	.10	...	.10	...	.10
Stearate, 50 lb bbls	lb.	...	.23	.21½	.24½	.20	.24½
Sulfate, crys, 400 lb. bbls wks	lb.	...	.029	.0275	.029	...	.029
Flake, bbls	lb.	...	.0325	...	.0325	...	.0325
Sulfide, 500 lb bbls, delv	lb.	...	.07¾	.07¾	.08	.07¾	.08⅛
bgs, delv	lb.	...	.07½	.07½	.07¾	.07½	.08⅜
Sulfocarbolate, 100 lb kgs	lb.	.24	.26	.24	.26	.24	.26
Zirconium Oxide, crude, 70-75% grd, bbls, wks	ton	75.00	100.00	75.00	100.00	75.00	100.00

Oils and Fats

Babassu, tks, futures	lb.	nom.	.06	.06	.06⅝	.05⅞	.07⅜
Castor, No. 3, 400 lb drs	lb.	nom.	.11¾	.11¾	.12¾	.08¼	.12¾
Blown, 400 lb drs	lb.	nom.	.13¾	.13¾	.14¾	.10¼	.14¾
China Wood, drs, spot NY	lb.	.	.25¾	.22½	.28	.15	.28
Tks, spot NY	lb.	...	.24¾	.21½	.27	.14½	.27
Coconut, edible, drs NY	lb.	...	.07½	.07½	.09⅜	.08⅛	.10⅛
Manila, tks, NY	lb.	...	.02⅞	.02⅞	.03⅜	.02⅞	.04⅜
Tks, Pacific Coast	lb.	.02⅝	.02¾	.02⅝	.03½	.02⅝	.04⅜
Cod, Newfoundland, 50 gal bbls	gal.	...	.70	.65	.72	.29	.72
Copra, bgs, NY	lb.	.0185	.0190	.0165	.0190	.0160	.2625
Corn, crude, tks, mills	lb.	.05½	.05⅝	.05¾	.06½	.05⅛	.07⅛
Refd, 375 lb bbls, NY	lb.	.08	.08¼	.08	.09	.07½	.09¼
Degras, American, 50 gal bbls NY	lb.	.08	.09½	.08½	.10	.07	.10
English, bbls	lb.	.08½	.09½	.08½	.10	.07	.10
Greases, Yellow	lb.	...	.03⅜	.03⅜	.05¼	.03⅞	.06¾
White, choice, bbls, NY	lb.	...	.03¾	.03¾	.05⅝	.04½	.07½
Lard, Oil, edible, prime	lb.	...	.08	.08	.10	.09	.11¼
Extra, bbls	lb.	...	.07¾	.07¾	.09¾	.08	.10⅜
Extra, No. 1, bbls	lb.	...	.07½	.07½	.08⅞	.07¾	.10⅛
Linseed, Raw less than 5 bbl lots	lb.	...	.097	.097	.116	.092	.119
bbls, c-l, spot	lb.	.089	.091	.089	1.10	.084	.111
Tks	lb.	.083	.085	.083	.104	.078	.104
Menhaden, tks, Baltimore	gal.	.35	nom.	.32	.35	.21	.35
Refined, alkali, drs	lb.	...	.073	.071	.079	.062	.082
Tks	lb.	...	.067	.067	.071	.056	.076
Kettle boiled, drs	lb.	...	.085	.085	.093	.074	.094
Light pressed, drs	lb.	...	.067	.067	.075	.056	.076
Tks	lb.	...	.061	.061	.069	.067	.069
Neatsfoot, CT, 20°, bbls, NY	lb.	...	.16¾	.16¾	.19¼	.14¾	.19¼
Extra, bbls, NY	lb.	...	.07¾	.07¾	.09	.08	.10⅛
Pure, bbls, NY	lb.	...	.11¾	.11¾	.14¼	.10¾	.16¾
Oiticica, bbls	lb.	.17½	.18½	.17	.21	.09¼	.21
Oleo, No. 1, bbls, NY	lb.	...	.07½	.07¼	.07¾	.07¼	.12
No. 2, bbls, NY	lb.	...	.07¼	.07	.07½	.06¾	.11¼
Olive, denat, bbls, NY	gal.	...	1.45	.94	1.50	.82	1.40
Edible, bbls, NY	gal.	no prices		1.85	2.00	1.75	2.25
Foots, bbls, NY	lb.	...	.08¾	.08	.09	.06¾	.10
Palm, Kernel, bulk	lb	no prices		no prices		.034	.036
Niger, cks	lb.	...	.03⅞	.03⅞	.05½	.03⅝	.05½
Sumatra, tks	lb.	...	.02¼	.02¼	.03	.0265	.02¾
Peanut, crude, bbls, NY	lb.	...	.09	.06¾	.09	.06	.08
Tks, f.o.b. mill	lb	nom.	.06	.05½	.07⅛	.05¼	.07¼
Refined, bbls, NY	lb.	.08¾	.09	.08¼	.09¾	.08¾	.10¾
Perilla, drs, NY	lb.	...	.18	.19	.21	.09½	.16½
Tks, Coast	lb.	...	.17	.18½	.20	.089	.15¾
Pine, see Pine Oil, Chem. Sec.							
Rapeseed, blown, bbls, NY	lb.	nom.	.17½	.17	.17½	.14	.17½
Denatured, drs, NY	gal.	1.10	1.15	1.00	1.05	.80	1.05
Red, Distilled, bbls	lb.	.06¾	.07¾	.06¾	.09½	.06¾	.09½
Tks	lb.	.06¼	...	.06¼	.08	.064	.08½
Sardine, Pac Coast, tks	gal.	.38	nom.	.37	.39	.24	.38
Refined alkali, drs	lb.	...	.073	.073	.081	.062	.082
Tks	lb	...	.067	.067	.075	.056	.076
Light pressed, drs	lb.	...	.067	.067	.075	.056	.076
Tks	lb.	...	.061	.061	.069	.05	.07
Sesame, white, dom	lb.	.16	nom.	.11½	.11¾	.09	.12
Soy Bean, crude							
Dom, tks, f.o.b. mills	lb.	...	.05⅛	.05⅛	.06¼	.04½	.06½
Crude, drs, NY	lb.	.06	.06½	.06	.07¾	.05⅛	.07⅜
Ref'd, drs, NY	lb.	.06⅞	.07⅜	.06⅞	.08½	.06⅜	.09
Tks	lb.	.06⅛	.06⅜	.06⅛	.07⅜	.05¾	.07¾
Sperm, 38° CT, bleached bbls, NY	lb.	...	.11	.105	.11	.09	.103
45° CT, blchd, bbls, NY	lb.	...	.103	.098	.103	.083	.096
Stearic Acid, double pressed dist bgs	lb.	.09¾	.10¾	.09¾	.13	.10	.13½
Double pressed saponified bgs	lb.	.10	.11	.10	.13¾	.10¼	.13¾
Triple pressed dist bgs	lb.	.12½	.13½	.12½	.16½	.12¾	.16½
Stearine, Oleo, bbls	lb.	nom.	.05¼	.05¼	.06½	.05½	.12
Tallow City, extra loose	lb.	nom.	.04¼	.04¼	.05⅜	.04⅜	.07
Edible, tierces	lb.	nom.	.04¼	.04¼	.05¾	.04½	.07¾
Acidless, tks, NY	lb.	...	.07¼	.07	.08	.07	.09¼
Turkey Red, single, drs	lb	...	.085	.082	.09	.06	.08⅝
Double, bbls	lb.	...	.11¼	.11	.12¾	.08¾	.11¼
Whale:							
Winter bleach, bbls, NY	lb.	...	095	...	.095	.075	.095
Refined, nat, bbls, NY	lb	...	.091	...	.091	.071	.091

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A203. Dyes; Folder announcing release of two new improved acetate soluble diazo blacks. General Dyestuff Corp.

A204. Glycerine in Food Products; General Information and bibliography. Glycerine Producers' Association.

A205. Painting of Creosoted Wood; describes seasoning after treatment and gives directions for painting creosoted poles and posts with aluminum paint. Wood Preserving Corp.

A206. Tetra Sodium Pyrophosphate; 12-page booklet gives properties and applications of this compound. American Cyanamid & Chemical Corp.

A207. The Use of Sulphur in Soils; 90-page booklet giving very complete information and data on subject. Texas Gulf Sulphur Co.

A208. To Dry Air; Folder explains how to end condensation in places where excessive moisture in the air causes mildew, mold or warping. It shows how calcium chloride absorbs moisture from the air and contains description and illustration of simple container for exposing calcium chloride to the air. Solvay Sales Corp.

Equipment—Containers

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E299. Flamenol; Descriptive sheet containing information on types and applications synthetic-insulated wire. General Electric Co.

E300. Glascote; Bulletin illustrates and describes glass-lined pipe and pipe fittings and other Glascote specialties. Glascote Products, Inc.

E301. Murex Electrodes; Pocket-sized pamphlet covering data on physical properties, chemical analysis, qualifications, approvals and recommended procedures for this line of electrodes. Metal & Thermit Corporation.

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"We"—Editorially Speaking

At Purdue University on June 14 the American Chemical Society put on display garments that "come from test tubes"—a demonstration of recent trends in chemistry. That the party was quite decorous, however, can be gathered from the following report taken from the *American Glass Review*:—"One model was clothed from hat to heels in materials made in the chemical laboratory. Among the garments displayed was a glass bathing suit."

❖❖❖❖

Walker & Downing, well-known Pittsburgh agency, preparing the advertisement reproduced below for its client, Diamond Alkali, could not find any youngster's photograph in their files that

adequately filled the requirement of "a regular boy." One of the agency's copy writers was passing a photographic studio in downtown Pittsburgh, saw a youngster's picture in the window and dashed back to his office with a print under his arm. Imagine George Cooper's surprise when he opened a copy of one of the magazines in the sanitation field and found "Skeeter" (George S. Cooper, Jr.) large as life. George senior is still trying to find out how the agency got the picture.

❖❖❖❖

It seems element 87 is again bobbing up in the news columns. Back in 1931 Drs. Jacob Papish and Eugene Wainer of Cornell announced that they had discovered the elusive 87 and simultaneously Dr. Fred Allison of Alabama "Poly" claimed that he had found it. Latest claimant is Dr. Walter Minder of the Radium Institute of Berne, Switzerland. To the lay public it must sound like "making a mountain out of a mole hill," but, as Dr. L. W. Bass pointed out in his article in CHEMICAL INDUSTRIES just a month ago, pure research is the basis of most if not all of our industrial research. Little did the lay public suspect when scientists were filling out the Mendelyeev table of elements with the discovery of several of the rare earths that the basis of an entirely new industry was being laid, yet along came Dr. Carl Auer von Welsbach and gave us the Welsbach mantle. And lest you think that Welsbach mantles have entirely passed from use come up some time and see us on Leete's Island in the Connecticut Sound. In fact this is being written under a kerosene lamp equipped with a mantle made by dipping a "stocking" in a solution of rare earth elements.

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The magazine *Hotel Management* recently printed a number of "Don'ts in Dealing With the Press." "We" got quite a chuckle out of several of the following:

Don't put the press table at the banquet back in the corner.

Remember that the reporters should hear all the speakers.

Do not write or ask why a story was not used. Remember that you are being given a favor.

Do not call up at the last minute with an invitation and expect quick action. Reporters are awfully busy.

Do not try to put one over on the papers. They will never forget it.

Do not try to buy advertising on a basis of how much publicity you can get. Let the editor be the judge as to what is news.

Don't pad your news releases. Short snappy news gets the best break.

Don't be a hog and expect more publicity than you are entitled to.

Don't forget that editors and reporters have wives or sweethearts. Include them in your invitation once in a while.

Don't ask an editor to send you a copy of the write-up.

Don't send the same picture to all papers in the country.

Don't go over the editor's head to reach the publisher.

A good point for all publicity people to remember is that the most interesting subject to all people IS PEOPLE.

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Just as we were accusing the son and heir of taking liberties with the contents of the family golf bag along came a package we've been sort of hoping would make an early appearance—Monsanto plastic tees. And with the latter came the following little note headed "Editors Work Too Hard!" At last we had found somebody who appreciated editors!

"Is your step losing its youthful sprightliness? Do you wear the furtive, haunted expression of a rabbit in a shooting gallery when the boss comes into the news room? Do you dawdle with your dessert . . . start nervously when someone drops a type-slug behind you? Are you faded, careworn . . . etiolated?"

My gosh, do we editors look that bad? One look in the mirror confirmed our worst fears—so, so long until next month—we're off for the golf course.

Fifteen Years Ago

From our Files of August, 1925

The seventieth annual meeting of the American Chemical Society is now in session at the Biltmore Hotel, Los Angeles, Cal.

Dr. Lucien C. Warner, chairman of the board of Warner Chemical Co., died July 30 at his residence in New York.

Foreign trade of the United States in chemicals and allied products in first half of 1925 was considerably better than corresponding period of 1924. Exports were up 11 per cent. to $74,678,000, and imports 15 per cent. to $113,552,000.

In the reorganization plan of Virginia-Carolina Chemical Co. a new corporation is to be organized in Virginia, to be known as the Virginia-Carolina Chemical Corp.

Prof. Charles F. Chandler of Columbia University, New York, died in the Hartford Hospital, Hartford, Conn., on Tuesday, August 25.

Several consumers of chlorine and sulfur dioxide claimed at a hearing before the Interstate Commerce Commission that proposed re-classification of multi-unit tank car to remove it from tank car status and hence increase freight rate is unjust and not warranted.

After investigation, the Customs Service has found that there is no dumping of methanol on the American market.

Net sales of E I. du Pont de Nemours & Co. showed an increase of 18½ per cent. during first half of 1925 over same period in 1924. Sales for the period were $56,613,212.

Construction of rayon plant near Elizabethton, Tenn., by American Bemberg Co., will begin soon.

ECHNOLOGY DEPT:

VOL. 47
Aug. '40

CHEMICAL INDUSTRIES

Statistical and Technical Data Section

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DETROIT

State of Chemical Trade
Current Statistics (July 31, 1940)—p. 62

WEEKLY STATISTICS OF BUSINESS

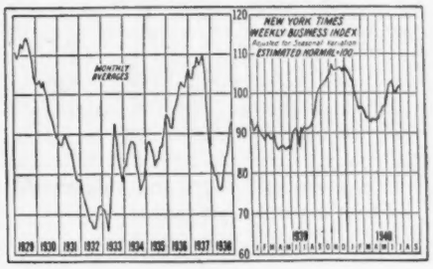
Week Ending	Carloadings 1940	Carloadings 1939	Carloadings % of Change	Electrical Output* 1940	Electrical Output* 1939	Electrical Output* % of Change	Jour. of Com. Price Index	Nat'l Chem. & Drugs	Fertilizer Fats & Oils	Ass'n Price Indices Fert. Mat.	Mixed Fert.	All Groups	†Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher Commodity Index
June 29.....	752,326	661,404	+13.7	2,514,461	2,300,268	+ 9.3	78.7	95.0	47.8	69.1	77.3	75.0	76.0	86.5	103.2	82.1
July 6.....	636,901	555,152	+14.7	2,264,953	2,077,956	+ 9.0	79.4	98.0	48.7	69.1	77.3	75.1	77.1	74.2	100.4	82.2
July 13.....	740,465	669,888	+10.5	2,483,342	2,324,181	+ 6.8	78.8	98.0	47.9	69.3	77.3	75.2	77.0	86.4	100.4	82.5
July 20.....	729,897	651,665	+12.0	2,524,084	2,324,181	+ 8.5	77.9	97.9	47.3	69.6	77.3	74.8	76.9	86.8	101.1	81.8

* K.W.H. 000 omitted. † 1926-1928 = 100.00.

MONTHLY STATISTICS

CHEMICAL:	June 1940	June 1939	May 1940	May 1939	April 1940	April 1939
Acid, sulfuric (expressed as 50° Baumé, short tons, Bureau of the Census)						
Total prod. by fert. mfrs.	.....	.....	191,643	155,902	192,846	145,689
Consumpt. in mfr. fert.	.....	.....	143,742	108,889	140,272	112,593
Stocks end of month	.....	.....	89,282	90,137	94,820	90,458
Alcohol, Industrial (Bureau Internal Revenue)						
Ethyl alcohol prod., proof gal..	.....	.....	20,953,298	18,655,386	20,217,860	17,857,461
Comp. denat. prod., wine gal ..	.....	.....	784,466	695,327	267,687	240,918
Removed, wine gal.	.....	.....	704,597	597,659	230,577	184,314
Stocks end of mo., wine gal...	.....	.....	458,262	608,836	378,239	511,723
Spec. denat. prod., wine gal. ..	.....	.....	9,252,869	7,794,973	9,726,116	7,477,594
Removed, wine gal.	.....	.....	9,332,216	7,605,163	9,562,558	7,338,850
Stocks end of mo., wine gal...	.....	.....	1,127,594	1,157,130	1,212,438	972,979
Ammonia sulfate prod., tons *a*..	.....	.....	57,697	33,064	54,570	39,635
Benzol prod., gal. *b*	.....	.....	10,375,000	5,456,000	9,588,000	6,813,000
Byproduct coke prod., tons *a*...	.....	.....	4,243,809	2,396,435	3,984,347	2,914,660
Cellulose Plastic Products (Bureau of the Census)						
Nitrocellulose sheets, prod., lbs.	535,266	704,235	544,352	755,527	532,327	802,067
Sheets, ship., lbs.	587,953	703,764	645,921	626,647	561,119	663,460
Rods, prod., lbs.	169,922	188,714	188,938	221,139	245,078	255,918
Rods, ship., lbs.	203,560	240,930	222,296	259,152	231,937	238,098
Tubes, prod., lbs.	64,756	63,772	67,056	59,539	74,649	58,420
Tubes, ship., lbs.	58,538	55,159	58,211	54,017	55,106	48,521
Cellulose acetate, sheets, rod, tubes						
Production, lbs.	633,808	446,093	702,385	490,684	558,358	508,264
Shipments, lbs.	562,223	378,046	648,535	508,786	490,206	522,346
Molding comp., ship.; lbs. ..	682,095	702,854	837,151	704,085	903,785	599,609
Methanol (Bureau of the Census)						
Production, crude, gals.	425,578	343,992	436,883	354,415	441,888	389,423
Production, synthetic, gals.	3,426,100	2,295,288	3,408,517	1,778,581	3,486,233	2,276,385
Pyroxylin-Coated Textiles (Bureau of the Census)						
Light goods, ship., linear yds...	.....	.....	2,639,599	2,652,199	2,859,620	2,642,840
Heavy goods, ship., linear yds...	.....	.....	1,875,376	2,106,754	2,146,261	1,933,597
Pyroxylin spreads, lbs. *c*	.....	.....	4,102,401	4,726,511	4,772,332	4,642,742
Exports (Bureau of Foreign & Dom. Commerce)						
Chemicals and related prod. *d*.	.....	.....	$18,460	$15,099	$15,929	$14,658
Crude sulfur *d*	.....	.....	$1,599	$600	$1,517	$979
Coal-tar chemicals *d*	.....	.....	$3,318	$1,088	$1,995	$989
Industrial chemicals *d*	.....	.....	$4,572	$2,467	$4,175	$2,354
Imports						
Chemicals and related prod. *d*..	.....	.....	$5,698	$15,000	$6,063	$19,000
Coal-tar chemicals *d*	.....	.....	$473	$1,062	$905	$4,129
Industrial chemicals *d*	.....	.....	$1,091	$2,524	$1,046	$2,202
Employment (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	119.2	109.8	120.8	112.9	123.4	116.6
Other than petroleum	118.2	107.2	120.6	111.7	123.9	116.4
Chemicals	138.3	116.5	136.2	116.5	135.2	117.0
Explosives	126.4	89.7	118.0	85.6	114.0	84.3
Payrolls (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	133.1	118.7	133.6	119.6	133.4	119.5
Other than petroleum	132.0	113.9	132.6	115.7	132.3	116.7
Chemicals	164.9	131.5	161.9	131.3	159.6	130.2
Explosives	153.7	100.9	141.2	95.6	133.1	93.8
Price index chemicals*	.....	.....	.....	.....	85.0	84.6
Drugs & Pharmaceuticals* ...	.....	.....	.....	.....	81.8	77.4
Fert. mat.*	.....	.....	.....	.....	70.7	68.1
Paint and paint mat.	.....	.....	.....	.....	86.7	81.3
FERTILIZER:						
Exports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials ...	.....	.....	108,207	148,095	65,798	136,328
Ammonium sulfate	.....	.....	.....	.....	12,275	208
Total phosphate rock	.....	.....	61,066	99,844	25,168	111,181
Total potash fertilizers	.....	.....	1,499	22,166	535	5,710
Imports (long tons, Nat. Fert. Association)						
Fertilizer and fert. materials ...	.....	.....	147,473	147,095	146,517	189,213
Ammonium sulfate	.....	.....	.....	.....	3,983	10,685
Sodium nitrate	.....	.....	79,299	62,010	89,679	115,188
Total potash fertilizer	.....	.....	30,197	10,453	19,553	16,580

INDUSTRIAL TRENDS



Business: Industrial production and general business activity continues to grow, but not at as rapid a pace as was set in June. The Federal Reserve Board's index of industrial production was placed at 114 for June, a rise of 8 points over May. It may progress to 118 for July and then remain more or less constant for some time.

Steel: Steel production is being pushed higher. Ingot production rose from 60% at the beginning of May to 87% in latter part of June and has since progressed to more than 90%. Production of coke and pig iron showed similar sharp increases and iron ore shipments down the lakes were at near-capacity levels. In one steel district, Wheeling-Weirton, production has gone over theoretical capacity to 104%. In Buffalo and Detroit districts rates are at capacity. Reflecting optimism of steel producers, additional blast furnaces are being made ready. Some of these are old furnaces being reconditioned and some are new furnaces. The supply of coke is becoming an important consideration. Beehive ovens which are seldom used except in emergencies are being put back into service. In Western Pennsylvania there are now 3,300 in operation against 1,850 in mid-June. Tonnage of new orders for July are slightly less than for June but are still over shipments and backlogs rise.

Electric Output: Electrical production has been stimulated during the past month by hot weather and increased industrial activity. The influence of warm weather on demand for electricity is indicated by recent survey of Edison Electric Institute which showed that air-conditioning equipment on lines at end of 1939 was driven by motors rated at 1,045,000 kilowatts.

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Carloadings: Loadings of revenue freight continue high and are maintaining distinct advantages over last year's figures. The peak for the year was registered in week ended July 20 when total was 752,326. The national defense program and other factors give rise to expectations that the peak of 860,000 cars, reached in mid-October last year, will be attained or surpassed.

Automotive: In accordance with seasonal influences production has decreased since May, although keeping well ahead of last year's figures. Retail sales, however, have continued unusually strong. For July sales were approximately 275,000 a 20% gain over last year. Stocks in hands of domestic dealers are still high and this would indicate a further production cut.

Textiles: There was a further sharp advance in activity at woolen mills. Output was reduced less than seasonally at cotton mills. Rayon production maintained its high levels and silk continued at very slow rate. Government orders are now becoming an important factor in the textile field and in view of this cotton goods industry is expected to pick up substantially.

Retail Trade: Retail trade in July made the best showing for that month in several years, according to some sources. All divisions shared in gains. This gain in July following rise in June is important because it indicates that recently imposed defense taxes on list of consumers' goods have not yet influenced purchasing power. The Federal Reserve Board reports that for week ended July 27 department store sales were 5% larger than corresponding week in 1939.

Construction: Industrial construction is approaching a record level. The defense program on top of an already active rate makes this a safe statement. A total of $170,834,000 for engineering construction awards plus $47,000,000 for Federal defense works in United States possessions in week ended July 18 set new all time high.

Outlook: The business and industrial outlook continues to improve. While there is a general feeling of optimism, one big question mark remains in the minds of many people. That is the much threatened and anticipated German attack on England. Although American industry and the American people are looking forward to a continuation of gains made solely by our own private needs and defense preparations, the outcome of the battle of England can be so important to our whole program that developments in Europe must command close attention.

MONTHLY STATISTICS (cont'd)

	June 1940	June 1939	May 1940	May 1939	April 1940	April 1939
FERTILIZER: (Cont'd)						
Superphosphate e (Nat. Fert. Association)						
Production, total	.....	.....	303,167	241,109	288,308	236,703
Shipments, total	.....	.....	560,250	532,795	853,623	807,405
Northern area	.....	.....	398,667	372,593	362,601	344,146
Southern area	.....	.....	161,583	160,202	491,022	463,259
Stocks, end of month, total	.....	.....	965,828	825,238	1,200,321	1,079,891
Tag Sales (short tons, Nat. Fert. Association)						
Total, 17 states	.....	.....	406,474	390,982	1,183,033	1,276,336
Total, 12 southern	.....	.....	328,702	312,313	1,125,397	1,232,279
Total, 5 midwest	.....	.....	77,772	78,669	57,636	44,057
Fertilizer employment *i*	88.4	78.9	129.1	113.2	174.5	176.6
Fertilizer payrolls *i*	78.6	64.9	118.6	108.2	136.2	135.7
Value imports, fert. and mat. *d*	.....	.....	$3,406	$3,479	$3,152	$4,370
GENERAL:						
Acceptances outst'd'g *f*	$206	$244	$213	$246	$223	$237
Coal prod., anthracite, tons	.....	.....	3,955,000	5,073,000	3,746,000	3,227,000
Coal prod., bituminous, tons	.....	.....	35,468,000	17,927,000	32,962,000	10,747,000
Com. paper outst'd'g *f*	$224	$180	$234	$188	$238	$191
Failures, Dun & Bradstreet	1,114	1,119	1,238	1,334	1,291	1,331
Factory payrolls *i*	97.9	96.3	96.3	85.0	96.3	85.5
Factory employment *i*	99.7	93.4	99.0	93.0	99.6	94.1
Merchandise imports *d*	$211,390	$178,866	$211,382	$202,502	$212,240	$186,296
Merchandise exports *d*	$350,458	$325,306	$318,051	$246,119	$316,530	$227,624
GENERAL MANUFACTURING:						
Automotive production	344,636	309,738	391,215	297,542	432,746	337,375
Boot and shoe prod., pairs	27,585,848	32,312,819	29,261,910	32,708,118	31,056,156	33,058,064
Bldg. contracts, Dodge *j*	$324	$288	$328,914	$308,487	$300,504	$330,030
Newsprint prod., U. S. tons	.....	.....	90,207	85,872	86,277	77,393
Newsprint prod., Canada, tons.	.....	.....	323,563	250,015	268,947	220,843
Glass containers, gross‡	.....	.....	4,700	4,516	4,584	4,071
Plate glass prod., sq. ft.	.....	.....	11,720,547	8,035,800	12,366,500	7,268,100
Window glass prod., boxes	.....	.....	1,068,231	728,653	1,023,465	738,951
Steel ingot prod., tons	5,532,000	3,523,000	4,841,403	3,295,164	3,974,706	3,352,774
% steel capacity	.....	.....	72	48.64	61.04	51.11
Pig iron prod., tons	3,818,000	2,372,000	3,513,683	1,923,618	3,137,019	2,302,918
U.S. cons'pt. crude rub., lg. tons	46,505	48,438	51,619	45,484	50,103	44,166
Tire shipments	6,718,761	5,849,008	5,720,249	4,800,261	5,009,762	4,457,735
Tire production	5,127,384	4,975,604	5,415,314	4,472,767	5,105,953	4,310,424
Tire inventories	8,984,994	8,632,494	10,576,217	9,539,813	10,881,029	9,812,695
Cotton consumpt., bales	.....	.....	.....	605,363	623,893	543,187
Cotton spindles oper.	21,942,748	21,771,310	22,217,302	21,975,222	22,301,218	22,122,902
Silk deliveries, bales	17,307	26,256	18,997	26,150	21,740	21,802
Wool consumption *s*	.....	.....	26.9	29.8	21.4	27.7
Rayon deliv., lbs.	.....	.....	31,900,000	26,300,000	30,700,000	23,100,000
Hosiery (all kinds) *t*	.....	.....	8,009,504	9,090,063	8,091,697	8,678,567
Rayon employment *i*	306.0	286.9	304.3	295.7	305.8	302.4
Rayon payrolls *i*	314.3	271.8	311.4	273.0	311.1	278.6
Soap employment *i*	81.9	79.6	81.4	78.1	81.2	78.7
Soap payrolls *i*	101.1	97.3	98.0	93.9	98.0	94.9
Paper and pulp employment *i*	116.4	106.2	115.2	106.7	112.0	106.3
Paper and pulp payrolls *i*	126.1	104.5	124.3	105.6	115.4	104.7
Leather employment *i*	80.2	84.8	80.8	83.3	82.7	85.8
Leather payrolls *i*	75.4	82.2	76.8	78.7	78.2	81.4
Glass employment *i*	.....	.....	103.9	97.4	105.3	97.8
Glass payrolls *i*	.....	.....	110.9	96.3	114.2	93.8
Rubber prod. employment *i*	83.5	80.1	84.1	81.2	84.7	82.1
Rubber prod. payrolls *i*	86.4	82.1	87.1	80.0	86.5	81.0
Dyeing and fin. employment *i*	115.0	116.8	122.6	123.7	125.4	125.6
Dyeing and fin. payrolls *i*	92.2	97.1	99.2	103.3	104.7	106.3
MISCELLANEOUS:						
Oils & Fats Index (26=100)[1]	53.1	53.7	57.0	56.0	59.2	55.3
Gasoline prod. *p*	.....	.....	52,183	51,384	50,625	48,837
Cottonseed oil consumpt., bbls.	246,655	256,799	293,705	251,004	293,705	251,004
PAINT, VARNISH, LACQUER, FILLERS:						
Sales 680 establishments	$37,897,861	$38,504,857	$43,463,222	$41,853,977	$37,656,398	$33,999,205
Trade sales (580 establishments)	$21,718,413	$22,341,180	$24,943,448	$25,436,932	$20,188,957	$18,862,040
Industrial sales, total	$12,582,231	$12,585,957	$14,150,310	$12,578,360	$13,849,723	$11,843,829
Paint & Varnish, employ. *i*	126.4	124.3	125.9	123.4	124.3	122.5
Paint & Varnish, payrolls *i*	136.7	128.9	136.0	129.8	131.9	125.6

a Bureau of Mines; *b* Crude and refined plus motor benzol, Bureau of Mines; *c* Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly; *d* 000 omitted, Bureau of Foreign & Domestic Commerce; *e* Expressed in equivalent tons of 16% A.P.A.; *f* 000,000 omitted at end of month; *i* U. S. Dept. of Labor, 3 year average, 1923-25 = 100, adjusted to 1937 census totals; *j* 000 omitted, 37 states; *p* Thousands of barrels, 42 gallons each; *q* 680 establishments, Bureau of the Census; *r* Classified sales, 580 establishments, Bureau of the Census; *s* 53 manufacturers, Bureau of the Census; *t* 387 identical manufacturers, Bureau of the Census, quantity expressed in dozen pairs; *v* In thousands of bbls., Bureau of the Census; ** Indices, Survey of Current Business, U. S. Dept. of Commerce; *z* Units are millions of lbs.; ‡ 000 omitted; * New series beginning March, 1940; [1] Revised series beginning February, 1940.

Du Pont Net Sets Record

Net profits of E. I. du Pont de Nemours & Co. and wholly owned subsidiaries for the three months ended June 30, 1940, were $23,126,507, equivalent to $2.02 a share on the outstanding common stock after allowing for preferred dividends. This compares with net profits of $20,796,159, or $1.73 a share, in the corresponding period of 1939.

The statement for the first six months of 1940 shows net income of $46,853,695, of $4.06 a share on the common stock, as reported in a preliminary estimate, compared with $39,871,535, or $3.28 a common share, in the first half of 1939.

Net income for the three months ended June 30, 1940, included the company's equity in undivided profits of controlled companies not wholly owned, of $22,348,879. For the first half of 1940 the total was $44,877,680.

Chemical earnings of E. I. du Pont de Nemours & Co. in June quarter were the largest in its history. The company's previous best quarter was the final quarter of 1939.

Earnings Statements Summarized

Company:	Annual dividends	Net income 1940	Net income 1939	Common share earnings 1940	Common share earnings 1939	Surplus after dividends 1940	Surplus after dividends 1939
Abbott Laboratories:							
June 30 quarter	y$1.60	$384,628	$394,172	h$.49	h$.55	.....	.....
Six months, June 30	y 1.60	1,130,119	1,012,007	h1.46	h1.43	.....	.....
Twelve months, June 30	y 1.60	2,166,205	1,804,862	h2.78	h2.55	.....	.....
Air Reduction Co., Inc.:							
June 30 quarter	y 2.00	1,663,106	1,205,340	h.61	h.47	.....	.....
‡‡Six months, June 30	y 2.00	3,106,096	2,232,595	h1.14	h.87	.....	.....
American Cyanamid Co.:							
**June 30 quarter	x .60	1,348,526	1,109,236	c.49	c.41	.....	.....
Six months, June 30	x .60	3,024,128	2,149,714	c1.11	c.80	.....	.....
American Zinc, Lead & Smelting Co.:							
June 30 quarter	f ...	174,040	41,384	.13	r.62	.....	.....
‡‡Six months, June 30	f ...	253,640	86,153	.12	r1.29	.....	.....
Twelve months, June 30	f ...	487,119	84,519	.21	r1.27	.....	.....
Atlas Powder Co.:							
June 30 quarter	y 3.50	379,822	229,206	1.17	.58	.....	.....
Six months, June 30	y 3.50	744,518	449,913	2.29	1.12	.....	.....
Catalin Corp.:							
Six months, June 30	y .25	116,406	71,494	.22	.13	.....	.....
Corn Products Refining Co.:							
**June 30 quarter	3.00	2,046,186	2,201,335	.64	.70	.....	.....
Six months, June 30	3.00	4,407,724	4,204,693	1.40	1.32	d$247,359	d$450,390
Dow Chemical Co.:							
Year, May 31	y 3.00	7,159,167	4,178,485	6.65	3.76	3,763,403	913,003
du Pont de Nemours & Co., E. I.:							
June 30 quarter	y 8.00	23,126,507	20,796,159	j2.02	j1.73	1,897,737	4,770,104
Six months, June 30	y 8.00	46,853,695	39,871,535	j4.06	j3.28	4,375,651	7,816,961
Fansteel Metallurgical Corp.:							
Six months, June 30	f ...	126,753	100,177	.52	.41	.....	.....
Goodrich B. F. Co.:							
Six months, June 30	y 1.00	1,362,691	3,122,728	.26	1.61	.....	.....
Hercules Powder Co.:							
June 30 quarter	y 3.25	1,550,493	1,182,143	1.08	.79	.....	.....
Six months, June 30	y 3.25	3,293,066	2,269,470	2.30	1.52	.....	.....
Lindsay Light & Chemical Co.:							
Six months, June 30	...	57,376	22,836	.81	.25	.....	.....
Monsanto Chemical Co.:							
June 30 quarter	§ 2.00	1,465,689	918,801	1.07	.64	.....	.....
Six months, June 30	§ 2.00	3,107,726	2,061,065	2.30	1.46	.....	.....
National Oil Products:							
Six months, June 30	y 1.85	376,498	308,242	2.09	1.71	.....	.....
New Jersey Zinc Co.:							
June 30 quarter	y 3.00	1,553,156	971,382	.79	.49	.....	.....
Six months, June 30	y 3.00	3,318,268	2,047,648	1.69	1.04	.....	.....
St. Joseph Lead Co.:							
Six months, June 30	k .75	2,576,820	1,415,028	1.32	.72	1,110,060	437,188
United States Gypsum Co.:							
Six months, June 30	y 4.00	3,536,458	3,117,857	2.73	2.38	.....	.....
Twelve months, June 30	y 4.00	7,784,448	5,662,135	6.06	4.28	.....	.....
Union Carbide & Carbon Co.:							
June 30 quarter	y 2.20	9,503,469	5,457,519	h1.02	h.60	.....	.....
Victor Chemical Works:							
June 30 quarter	y 1.50	258,855	203,368	.37	.29	.....	.....
Six months, June 30	y 1.50	485,845	436,983	.70	.62	.....	.....
Westvaco Chlorine Products Corp.:							
June 30 quarter	y 2.40	367,966	275,649	.87	.60	.....	.....
‡‡Six months, June 30	y 2.40	728,562	520,712	1.72	1.11	.....	.....

a On Class A shares; *b* On Class B shares; *c* On combined Class A and Class B shares; *d* Deficit; *f* No common dividend; *j* On average number of shares; *k* For the year 1940; *p* On preferred stock; On Class A shares *y* Amount paid or payable in 12 months to and including the payable date of the most recent dividend announcement; ‡ Indicated quarterly earnings as shown by comparison of company's reports for the 6 and 9 months periods; § Plus extras; *n* Preliminary statement; *h* On shares outstanding at close of respective periods; ** Indicated quarterly earnings as shown by comparison of company's reports for 1st quarter of fiscal year and the six months period. ‡‡ Indicated earnings as compiled from quarterly reports. † Net loss. * Not available.

Price Trend of Representative Chemical Company Stocks

	June 29	July 6	July 13	July 20	Net gain or loss last mo.	Price on July 22, 1939	1940 High	1940 Low
Air Reduction Co.	39¼	40	39	40	+¾	58¼	58⅜	36½
Allied Chemical and Dye	148	148	145	148	...	171¼	182	135½
Amer. Agric. Chem.	15	14¾	15	15	...	18½	21	12⅛
Amer. Cyanamid "B"	32½	31¾	31⅜	32⅝	+⅛	...	39⅞	26
Columbian Carbon	81	82	81	79⅜	—1⅝	94	98¾	71
Commercial Solvents	9⅛	8⅞	9	9⅛	...	11⅞	16⅝	8
Dow Chemical Co.	154	150	151½	147	—7	129	171	137
Du Pont	158	158	157¾	157¾	—¼	158½	189¼	146½
Hercules Powder	85	83	80	80	—5	73¾	100½	76¼
Mathieson Alkali	25½	23½	24	24½	—1	25½	32¾	21
Monsanto Chem. Co.	92	89⅞	93	90⅛	—1⅞	103⅞	119	86¾
Standard Oil of N. J.	33	32¾	34½	34⅛	+1⅛	43¾	46½	29⅞
Texas Gulf Sulphur	30⅝	30⅞	30¾	31	+⅜	30	34¾	26⅛
Union Carbide and Carbon	69½	68½	68¾	68½	—1	83½	88⅜	59⅞
U. S. Industrial Alcohol	19	18½	19	18¼	—¾	18½	28	14

Monsanto Earns $1.07

Monsanto Chemical Co. and American subsidiaries report for quarter ended June 30, 1940, net profit of $1,465,689 after depreciation, obsolescence, federal income taxes under Revenue Act of 1940, etc., equal after preferred dividend requirements and minority interest, to $1.07 a share on 1,241,694 shares of common stock.

This compares with net profit of $918,801 or 64 cents a common share in June quarter of previous year. For quarter ended March 31, 1940 company reported net profit, after minority interest, of $1,634,208 or $1.23 a common share.

For six months ended June 30, 1940, net profit was $3,107,726, equal after preferred dividend requirements and minority interest, to $2.30 a common share, comparing with $2,061,065 or $1.46 a common share in first six months of 1939.

American Cyanamid Nets $3,024,128

Report of American Cyanamid Co. and subsidiaries for six months ended June 30, 1940, subject to audit and year-end adjustments, shows net profit of $3,024,128 after depreciation, depletion, research and process development expenses, interest, amortization, federal income taxes, etc., equivalent after preferred dividend requirements, to $1.11 a share on 2,618,365 shares (par $10) of combined Class A and Class B common stocks.

This compares with $2,149,714 or 80 cents a share on 2,618,369 combined common shares in first half of 1939.

National Oil Products Nets $2.09

Report of National Oil Products Co. for six months ended June 30, 1940, shows net profit of $376,498 after depreciation, depletion, federal income taxes, etc., equal to $2.09 a share on 179,825 shares (par $4) of capital stock. This compares with $308,242 or $1.71 in first half of 1939.

Chemical Finances

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Chemical Stocks and Bonds

PRICE RANGE July 1940 Last	High	Low	1939 High	Low	1938 High	Low	Sales	Stocks	Par $	Shares Listed	Dividends	Earnings** $-per-share-$ 1939	1938	1937
							Number of shares July 1940	1940						
NEW YORK STOCK EXCHANGE														
58⅞	70¼	50	71⅛	53	61	46¾	1,300	28,800	Abbott Labs.	No	752,468	$2.05	2.61	2.43	2.51
42¼	58⅜	36½	68	45¼	67⅞	40	18,000	200,400	Air Reduction	No	2,563,992	1.50	1.98	1.47	2.86
150	182	135½	200½	151½	197	124	9,300	82,600	Allied Chem & Dye	No	2,214,099	9.00	9.50	5.92	11.19
14¼	21	12⅛	24½	16	28½	22	1,600	26,000	Amer. Agric. Chem	No	627,987	1.30	1.22	2.23	2.95
5	8¼	4⅛	11⅞	5½	15	9	1,100	43,000	Amer. Com. Alcohol	No	280,934	....	—.40	—2.05	3.23
27	35½	23	37	21	31½	20	900	13,100	Archer-Dan.-Midland	No	545,416	1.10	3.02	.43	5.03
61⅛	80½	57	71	50	68	36	400	14,300	Atlas Powder Co.	No	250,288	3.00	3.82	2.60	4.40
116	124¾	112½	127	116	126¼	105	1,960	4,570	5% conv. cum. pfd.	100	68,597	5.00	18.94	14.77	20.90
30	35½	20	30¼	13⅝	26⅝	9	29,400	548,200	Celanese Corp. Amer.	No	1,000,000	.50	3.53	.26	2.04
118½	119	105½	109⅞	84	96	82	2,180	23,680	prior pfd	100	164,818	7.00	37.72	15.05	27.07
12¼	20	10⅛	18	11½	17	7⅛	22,300	254,200	Colgate-Palm.-Peet	No	1,962,087	1.00	2.74	1.77	—.35
80	98¾	71	96	73	98½	53¾	700	18,000	Columbian Carbon	No	537,406	4.50	5.32	5.13	8.31
9¾	16⅝	8	16	8⅝	12¼	5⅞	25,800	688,300	Commercial Solvents	No	2,636,878	....	.61	—.11	.60
50	65⅛	44½	67½	54⅞	70⅝	53	8,100	119,000	Corn Products	25	2,530,000	3.00	3.32	3.18	2.52
174	179	165	177	150	177	162	1,000	4,800	7% cum. pfd.	100	245,738	7.00	41.18	39.69	32.96
14⅜	23¼	12½	32⅜	18	40⅞	25	1,960	18,900	Devoe & Rayn. A.	No	95,000	....	2.05	—1.73	4.05
145	171	137	144⅝	101½	141	87⅞	4,800	56,200	Dow Chemical	No	1,034,988	3.00	3.76	3.91	4.15
163½	189¼	146½	188½	126¼	154¾	90½	25,900	266,500	DuPont de Nemours	20	11,065,762	7.00	7.70	3.74	7.37
125	126	114	124½	112	120½	109½	2,500	37,950	4½% pfd.	No	1,688,850	4.50	52.25	37.27	165.48
122	166¾	117	186⅛	133⅛	187	121½	15,400	112,700	Eastman Kodak	No	2,476,013	6.00	8.55	7.54	9.76
170	178	155	183½	155½	173	157	130	1,320	6% cum.	100	61,657	6.00	349.31	281.22	362.45
31	38¾	24¾	36	18¼	32	19⅞	12,900	143,800	Freeport Sulphur	10	796,380	1.50	2.76	1.87	3.30
7	10	5½	10⅞	7	12½	6¾	1,400	30,300	Gen. Printing Ink	1	735,960	.80	.94	.62	1.32
12¾	19¾	11	24½	14	28½	13	3,800	75,100	Glidden Co.	No	829,989	.50	1.70	—.29	2.62
39⅛	44⅝	30	47	34	51½	37	600	6,200	4½% cum. pfd.	50	199,940	2.25	4.27	1.03	12.72
95	113¼	89⅞	112¼	93	111	76¾	2,300	13,000	Hazel Atlas	25	434,409	5.00	6.64	4.97	6.67
82	100½	76¼	101½	63	87	42¾	4,300	67,900	Hercules Powder	No	1,316,710	2.85	3.65	1.95	2.97
79	100½	76¼	135½	128½	135¼	126¾	260	3,850	6% cum. pfd.	100	96,194	6.00	60.87	35.31	50.75
22¼	29	16⅜	29½	16¾	30⅜	14⅜	3,400	59,700	Industrial Rayon	No	759,325	.75	1.77	.24	.34
26¼	47⅜	22	46¼	17½	34½	15	1,500	49,300	Interchem.	No	290,320	.40	4.10	.32	1.44
100	113	91	109½	90	98	80	40	4,500	6% pfd.	100	65,661	6.00	24.27	7.39	12.26
19½	38	18⅛	3⅝	1½	3⅞	2	1,600	44,600	Intern. Agricul.	No	436,048	....	—1.32	—0.003	.16
21	38	18⅛	41	16	29	15	400	12,300	7% cum. pfd.	100	100,000	....	1.26	7.01	7.70
23½	38⅞	19⅜	55⅜	35	57⅝	36⅞	66,400	607,300	Intern. Nickel	No	14,584,025	2.00	2.39	2.09	3.31
32	37⅛	26⅞	38	29	30¼	19½	2,100	9,200	Intern. Salt	No	240,000	1.75	1.92	2.29	2.11
17¾	23¾	14⅜	22½	14½	24	19⅛	1,000	11,700	Kellogg (Spencer)	No	509,213	1.10	1.39	.71	2.81
40	53⅜	30	56¾	36½	58¾	23¼	11,900	129,100	Libbey Owens Ford	No	2,513,258	2.75	3.21	1.57	4.19
14	18¾	10⅛	19	13½	21½	12½	3,400	70,800	Liquid Carbonic	No	700,000	1.00	1.62	1.81	2.37
25¼	32¾	21	37⅜	20¾	36⅞	19¾	2,700	74,700	Mathieson Alkali	No	828,171	1.50	1.12	1.01	1.81
92¾	119	86¾	114⅝	85⅝	110	67	7,800	98,400	Monsanto Chem.	No	1,241,816	3.00	4.01	2.35	4.46
119	118	110	121	110	117½	111	80	2,480	4½% pfd. A.	No	50,000	4.50	54.29	31.51	49.99
119	121½	113½	122½	112	...	...	230	2,070	4½% pfd. B.	No	50,000	4.50	54.29	31.51	49.99
17	22½	14⅛	27½	17⅞	31	17⅛	9,700	199,300	National Lead	10	3,095,100	.87	1.28	.75	.95
163	173⅜	160	173⅛	152	178½	154	500	3,500	7% cum. "A" pfd.	100	213,793	7.00	27.04	20.03	22.86
116¼	118½	112½	145	132	145½	127	360	2,320	6% cum. "B" pfd.	100	103,277	6.00	55.30	35.97	43.77
7⅜	14¼	6⅛	17⅝	8½	19½	9⅞	6,000	147,200	Newport Industries	1	620,459	....	.66	—.08	2.22
57½	64⅝	42	70	50	76¼	40	9,400	106,500	Owens-Illinois Glass	12.50	2,661,204	2.00	3.17	2.02	3.51
64½	71¾	53	66	50⅝	59	39½	12,100	142,100	Procter & Gamble	No	6,325,087	2.25	3.80	2.59	4.08
116¼	118½	112½	119⅝	112	122¼	114	440	6,270	5% pfd.	100	169,517	5.00	298.55	101.81	157.03
8½	13⅛	7⅝	17¼	9⅞	18⅜	10	8,300	133,600	Shell Union Oil	No	13,070,625	.50	.77	.70	1.44
103	108¾	95⅛	107⅞	98½	106½	93	1,700	9,700	5½ cum. pfd.	100	341,000	5.50	34.61	33.18	60.59
15½	23¼	12¼	29½	15½	34⅝	18½	5,500	50,200	Skelly Oil	No	995,349	.75	1.99	2.27	6.07
24⅝	29.	20⅜	30	22⅝	35½	24⅜	30,300	387,700	S. O. Indiana	25	15,272,020	1.25	2.24	1.82	3.16
33¾	46½	29⅞	53½	38	58⅝	39⅜	88,800	739,500	S. O. New Jersey	25	26,618,065	1.25	3.27	2.86	5.64
5⅞	7	4¼	9⅛	4	8	3⅞	7,500	75,700	Tenn. Corp.	5	853,696	....	.41	.46	1.09
39⅛	47⅝	33	50¾	32½	49⅝	37⅝	33,800	474,800	Texas Corp.	25	10,876,882	2.00	3.02	2.13	5.02
31¾	35⅝	26⅞	38½	26	38	26	9,300	127,100	Texas Gulf Sulphur	No	3,840,000	2.00	2.04	1.81	3.03
71½	88¾	59⅞	94¼	65½	90⅞	57	28,000	317,600	Union Carbide & Carbon	No	9,277,288	1.90	3.86	2.77	4.81
49	65⅝	42½	69½	52	73½	39	1,500	33,800	United Carbon	No	397,885	3.00	3.81	3.78	5.91
18¾	28	14	29⅝	13½	30¼	13½	2,400	90,000	U. S. Indus. Alcohol	No	391,238	....	.20	—1.08	1.24
31⅛	43⅞	25	40	16	28⅞	11½	22,500	417,700	Vanadium Corp. Amer.	No	377,140	1.00	3.25	.61	2.22
23	31½	19	29⅜	18¼	25¼	13½	1,300	21,400	Victor Chem.	5	696,000	1.40	1.59	1.05	1.01
2⅛	4¼	1¾	5¾	2½	5⅝	2¾	2,400	44,700	Virginia-Caro. Chem.	No	486,122	....	—1.57	—1.90	—.05
19	31¾	14	33¾	17	32½	15¾	1,500	31,400	6% cum. part. pfd.	100	213,052	....	2.41	1.90	5.88
33¼	38½	27¾	39¼	15¼	20¼	10	1,800	36,900	Westvaco Chlorine	No	339,362	1.85	2.81	1.52	1.46
25	39¼	28⅞	39½	29	31½	20	2,500	21,300	cum. pfd.	30	192,000	1.50	6.64	4.19	4.09
NEW YORK STOCK EXCHANGE														
35	39⅞	26	35¾	18⅜	30¼	15½	28,600	397,100	Amer. Cyanamid "B"	10	2,618,387	.60	2.07	.91	2.09
121½	127	98	112¾	76	92	50	1,300	17,700	Celanese, 7% cum. 1st pfd.	100	148,179	7.19	34.17	8.95	22.32
3¾	5⅞	2⅜	6¾	3	6¾	3	2,600	9,900	Celluloid Corp.	15	194,952	....	—.70	—2.73	—.92
7	7¾	7	7⅞	4½	12	6½	.....	700	Courtauld's Ltd.	£1	24,000,000	.13	4.92%	.20%	8.64%
5¾	8⅛	5	9¼	5	9⅞	6	800	14,300	Duval Texas Sulphur	No	500,000	....	1.25	.71	.43
71	92	60	68	30	41¼	27	625	15,125	Heyden Chem. Corp.	100	125,497	2.00	5.98	2.07	3.94
78½	104	65	117	90	115½	55	2,900	42,200	Pittsburgh Plate Glass	25	2,192,824	4.00	4.94	3.00	8.53
75	100	62½	113⅛	81	117¾	66	3,500	33,600	Sherwin Williams	25	638,927	2.75	5.96	2.43	8.76
110¼	114¾	106	116	106½	114⅛	107	190	2,100	5% cum. pfd.	50	132,189	5.00	35.08	8.76	45.50
PHILADELPHIA STOCK EXCHANGE														
170	185	158¾	179	135	167	121½	175	2,685	Pennsylvania Salt	50	150,000	6.00	10.52	6.29	11.79

PRICE RANGE July 1940 Last	High	Low	1939 High	Low	1938 High	Low	Sales	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE							July 1940	1940				
102¾	105¼	100⅛	103¾	98	105⅝	99⅛	257,000	1,327,000	Amer. I. G. Chem. Conv.	1949	5½	M-N	$22,400,000
28½	41	28	41½	19	38	25½	49,000	766,000	Anglo Chilean Nitrate inc. deb.	1967	4½	J	10,400,000
106	107½	105½	108⅝	101⅝	106⅛	102⅝	6,000	198,000	Dow Chemical	1951	3	J-D	5,000,000
105¼	106	100	102½	90	94	93	96,000	950,000	Industrial Rayon	1948	4½	J-J	7,100,000
30½	39¾	28	37	21⅛	35⅝	24¾	82,000	1,040,000	Lautaro Nitrate inc. deb.	1975	4	J-D	27,200,000
21	21	21	30	16	35⅝	24¾	....	5,000	Ruhr Chem.	1948	6	A-O	1,500,000
96⅞	97¾	93½	95⅝	88⅜	....	...	460,000	4,559,000	Shell Union Oil	1954	2½	J-J	85,000,000
104½	106⅜	101⅛	106¼	97⅝	105⅝	100	211,000	1,958,000	Standard Oil Co. (New Jersey) deb.	1961	3	J-D	85,000,000
104½	106⅜	100⅝	106½	94¼	103	98	237,000	1,892,000	Standard Oil Co. (New Jersey) deb.	1953	2¾	J-J	50,000,000
105⅛	106¾	102	105⅞	95¼	...	...	256,000	2,341,000	Texas Corp.	1959	3	A-O	40,000,000

* Paid in 1939, including extras but excluding dividends paid in stock.

** For either fiscal or calendar year.

New Trade Marks of the Month

RAY-SYLVAN
428,300

FLORICEL
428,310

GRID X "The Only Perfect Griddle Cleaner"
424,688

Karsan
421,863

LUX
423,251

CARMINOLINE
427,758

SOLUBLE AMBERINE YELLOW
427,759

FELAMINE
428,088

CEPRYN
429,245

THERMOL-GRANODINE
429,156

APOIDINA
429,193

AIRKEM
429,210

COMPESTRIN
429,304

DERMOST
429,319

AHCOSPUN
429,389

RESYNON
429,390

HITOX
429,400

BLACK-OUT
428,297

LARCOLOID
428,303

LUSHI
428,832

EVEREADY BUTANE GAS SYSTEM
427,696

GLAROX
428,730

MEAD'S
420,383

X-RAYOPAKE
428,033

RAYOPAKE
428,034

KLIP
428,178

Lustrotone FINISH
428,876

NERACHROM
428,293

DYCLENE
428,317

Six Master
428,333

BETAFERRUM
428,480

STA-O-GEN
428,878

B-JEN
429,040

CATYLON
429,571

AMODYN
427,127

APCODYN
427,128

VICULTATUR
429,174

PLASTIC ROCK
427,782

PLAST-O-LINE
429,048

426,626

PRECISION
423,894

Trade Mark Descriptions †

428,300. Brown Co., Portland, Me.; Feb. 7, '40; for wood pulp; since Jan. 10, '40.

428,310. Floridin Co., Warren, Pa.; Feb. 7, '40; for processed clay or Florida Fuller's Earth; since Dec. 19, '39

424,688. Grid X Company, Wichita, Kans.; Oct. 19, '39; for abrasive compound die-cast from plastic setting material for cleansing cooking utensils, polishing metal, or the like; since Apr. 15, '39.

421,863. Schering Aktiengesellschaft, Berlin, Germany; July 22, '39; for preparation for prevention of putrification of tuberous plants; since Sept. 26 '31.

423,251. Adde, Inc., Baltimore, Md.; Sept. 2, '39; for spirits of turpentine, castor oil and olive oil for medicinal use; since Jan. 3, '38.

427,758. H. Kohnstamm & Co., Inc., New York, N. Y.; Jan. 23, '40; for coal-tar dyes; since June 23, 1884.

427,759. H. Kohnstamm & Co Inc., New York, N. Y.; Jan. 23, '40; for coal-tar dyes; since Dec. 19, 1889.

428,088. Sandoz Chemical Works, Inc., New York, N. Y.; Jan. 31, '40; for medicinal preparation for treatment of ailments resulting from intestinal disorders; since '26.

428,245. The Wm. S. Merrell Co., Cincinnati, Ohio; Feb. 5, '40; for germicide and antiseptic; since Dec. 11, '39.

429 156. American Chemical Paint Co., Ambler, Pa.; March 4, '40; for compound for phosphate coating iron and steel surface; since Aug. 4, '39.

429,193. Parke, Davis & Co., Detroit, Mich.; March 4, '40; for gonadotropic substance derived from pregnancy urine, closely resembling the anterior pituitary gonad-stimulating hormone; since Jan. 5, '39.

429,210 Airox Co., New York, N. Y.; March 5, '40; for air deodorant; since Dec. 15, '39.

429,304. The Harrower Laboratory, Inc., Glendale, Calif.; March 7, '40; for compound of certain estrogenic substances, notably estrone and estradiol, originating from natural sources; since Feb. 26, '40.

429,319. Norman R. Pool (The Pool Chemical Laboratories), Toledo, Ohio; March 7, '40; for oils and ointments for uses in superficial disorders of the skin or mucous membrane; since June, '39.

429,389. Arnold Hoffman & Co., Inc., Providence, R I.; March 9, '40; for chemical products for use in processing textiles; since Sept. 17, '39.

429,390. Arnold, Hoffman & Co., Inc., Providence, R. I.; March 9, '40; for chemical products for use in processing textiles; since Feb. 19, '40.

429,400. Dom F. Evia (Hitox Products), New York, N. Y ; March 9 '40; for insecticide; since June, '34.

428,297. The R. T. Vanderbilt Co., Inc., New York, N. Y.; Feb. 6, '40; for coating material in nature of paint to protect rubber goods from sunlight deterioration; since Jan. 30, '40.

428,303. Carpenter-Morton Co., Boston, Mass.; Feb. 7, '40; for clear varnish and varnish combined with pigment to form enamel; since Jan. 1, '31.

428,832. Jakob L. Schiff (The Chemical Products Co.), Baltimore, Md.; Feb. 23, '40; for paint remover; since Feb 1, '38.

427,696. Charles J. Bender, Dallas, Tex.; Jan. 22, '40; for butane gas storage and dispensing units; since Jan. 1, '38.

428,730. James Lucas Corp., Philadelphia, Pa.; Feb. 20, '40; for mineral substances; since Dec. 15, '39.

420,383. Mead Johnson & Co., Evansville, Ind ; June 10, '39; for drugs and pharmaceuticals; since Jan. 1, '26.

428,033-428,034. Hoffman-LaRoche, Inc., Nutley, N. J.; Jan. 30 '40; for preparation for use as a contrast medium in taking X-ray pictures of internal organs; since Dec. 6, '39 on "Rayopake" and Dec. 16, '40 on "X-Rayopake".

428,178. Stanco, Inc., Wilmington, Del., and New York, N. Y ; Feb. 2, '40; for insecticides and fungicides; since Aug. 21, '28 on insecticides and Dec. 22, '39 on fungicides.

428,876. Kent Stores of Washington, Inc. Washington, D. C.; Feb. 24, '40; for preparation for treating fabrics for restoration of finish and fiber characteristics; since Dec. 28, '39.

428,293. Rohm & Haas Co., Philadelphia, Pa.; Feb. 6, '40; for mineral tanning material; since March 10, '33.

428,317. MacDermid Inc., Waterbury, Conn.; Feb. 7, '40; for cleaning preparation preparatory to electroplating; since Jan. 10, '40.

428,333. Rust Master Chemical Corp., Boston, Mass.; Feb. 7, '40; for chemical compounds and solutions for automotive engine overhaul; since Dec 10, '39.

428,480. Hart Drug Corp., Miami, Fla.; Feb. 12, '40; for pharmaceutical preparation for use in vitamin and iron deficiencies; since Jan. 18, '40.

428,878. Latimer Laboratory Inc., New York, N. Y.; Feb. 24, '40; for ozonide of olive oil in olive oil for treatment of wounds, burns, skin infections, and for the promotion of healing; since Jan. 25, '40.

429,040. Fellows Medical Manufacturing Co., Inc. New York, N. Y.; Feb. 29, '40; for preparation containing vitamin B; since Feb. 21, '40.

429,571. The Heart Products Corp., New York, N. Y; March 14, '40; for finishing agent for cotton and rayon fabrics; since April 20, '38.

427,127. Atlas Powder Co., Wilmington, Del.; Jan. 4, '40; for dynamite; since June 27, '38.

427,128. Atlas Powder Co., Wilmington, Del.; Jan. 4, '40; for dynamite; since Sept. 5, '30.

429 174. Dawe's Vitamins, Inc., Chicago, Ill.; March 4, '40; for plant fertilizers; since Feb. 17, '40.

427,782. United Laboratories, Inc., Cleveland, Ohio; Jan. 23, '40; for composition flooring and floor surfacing material made of granulated volcanic rock, asphaltic paste and a setting powder; since Nov. 12, '35.

429,048. Carl E Heil (Heil and Co.), Cleveland, Ohio; Feb. 29, '40; for thermoplastic tank lining material; since Jan., '38.

† Trademarks reproduced and described include those appearing in *Official Gazette* of the U. S. Patent Office, April 16 to June 4, 1940.

New Trade Marks of the Month

BRITEWAY
427,369

KLEK
428,642

CARBLEX
421,352

B-Compules
422,801

WRAP-RAX
423,947

FILABOND
424,933

424,986

BIMERPHEN
426,072

BETANOX
428,209

Thyloquinone
428,408

TEX-SAN
428,522

COSOL
428,654

AMYLIQ
428,977

WARCOTEX
429,111

429,342

PARAPONT
427,783

BLU-CHEK
429,813

ALKALON
429,050

SHELL
DUTREX
428,704

428,738

425,064

ETHYL TUADS
429,880

BITUMINITE
428,727

PICCOLYTE
429,915

PICCOUMARON
429,916

CYRENE
428,401

424,606

merfarona
429,251

QUADRAFOS
429,457

MECHLING'S
429,525

EASTMAN ACETATE DYESTUFFS
429,222

KAYNONE
430,166

KAYQUIN
430,167

PENESOL
430,698

VENALOY
429,398

CLARCO CLARCO SYSTEM CO.
390,585

Declene
427,371

CITRALKA
430,795

VINYON
430,436

X-V REVERSAL COMPOUND
419,055

MEQUINONE
430,168

CARBOWAX
430,385

ZAPONOL
429,966

TAPROID
431,300

(*Trade Mark Descriptions Continued*)

426,626. Mitsubishi Shoji Kaisha Ltd., Tokyo, Japan, and New York, N. Y.; Dec. 15, '39; for vegetable waxes; since July 22, '13.

423,894. Precision Lubricants, Inc., Denver, Colo.; Sept. 23, '39; for automobile polishes and waxes; since July 1, '39

427,369. The C. B. Dolge Co., Westport, Conn.; Jan. 12, '40; for liquid cleaner for floors, tile, windows; since May, '36.

428,642. Colgate-Palmolive-Peet Co., Jersey City, N. J.; Feb 17, '40; for soap; since Jan. 9, '40.

421,352. Musher Foundation, Inc., New York, N. Y.; July 7 '39; for food antioxidants; since Jan. 4, '38.

422,801. Abbott Laboratories, North Chicago, Ill.; August 21, '39; for vitamin B complex preparation; since Aug. 8, '39.

423,947. Hanson-Van Winkle-Munning Co., Matawan, N. J.; Sept. 26, '39; for liquid preparation to form coating on plating racks to protect them from electroplating solutions; since Jan. 1, '39.

424,933. Textile Glues, Inc. Paterson, N. J.; Oct. 26, '39; for glues; since '36.

424,986. The American Products Co. (Visco Chemical Products Co.), Cincinnati Ohio; for lighter fluids, insecticides and other chemical specialties; since Nov. 1, '34.

427,783. E. I. du Pont de Nemours & Co., Wilmington, Del.; Jan. 23, '40; for paradichlorobenzine; since Apr. 11, '34.

426,072. Sharp & Dohme, Inc., Philadelphia, Pa.; Nov. 29, '39; for antiseptic and germicidal solutions; since Nov 21, '39.

428,209. United States Rubber Co., New York, N. Y.; Feb. 3, '40; for antioxidants for natural or synthetic rubber or other oxidizable organic materials; since Nov. 29, '39.

428,408. E. R. Squibb & Sons, New York, N. Y.; Feb. 9, '40; for anti-hemorrhagic preparations; since Feb. 1, '40.

428,522. Hercules Powder Co., Wilmington, Del.; Feb. 13, '40; for textile finishing material; since Jan. 11, '40.

428,654. The Neville Co., Neville Island, Pittsburgh, Pa.; Feb. 17, '40; for coal tar solvents; since Jan. 24, '40.

428,977. Wallerstein Co., New York N. Y.; Feb. 27, '40; for preparation for liquefying starch in textile and paper industries; Feb. 18, '37.

429,111. Warwick Chemical Co., West Warwick, R. I.; March 1, '40; for chemical used in treating natural and synthetic yarns and fabrics; since Feb. 1, '40.

429,342. F. W. Berk & Co., Inc., New York, N. Y ; March 8 '40; for mercurial salts; since Feb. 3, '40.

429,813. General Chemical Co., New York, N. Y.; March 21, '40; for insecticides; since Feb. 13, '40.

429,050. Carl E. Heil (Heil & Co.), Cleveland, Ohio; Feb. 29, '40; for synthetic resinous varnishes; since July, '34.

428,704. Shell Oil Co. Inc., St. Louis, Mo.; Feb. 19, '40; for petroleum oil resins; since Jan. 17, '40.

428,738. Sylvania Industrial Corp., New York, N. Y.; Feb. 20, '40; for cellulose sheets; since Feb. 3, '40.

425,064. Polak's Frutal Works, Inc., Long Island City, N. Y ; for compositions of essential oils; since Jan. 1, '28.

429,880. R. T. Vanderbilt Co., Inc., New York, N. Y.; March 22, '40; for chemical compound used as accelerator in rubber.

428,727. Hercules Powder Co., Wilmington, Del.; Feb 20, '40; for dynamite; since Jan. 15, '40.

429,915-429,916. Pennsylvania Industrial Chemical Corp., Clairton, Pa.; March 23, '40; for hydrocarbon resins; since Jan. 30, '40.

428,401. The Neville Co., Neville Island, Pittsburgh, Pa.; Feb. 9, '40; for thermoplastic resins; since Dec. 6, '39.

424,606. Society des Usines Chemiques Rhone-Poulenc, Paris, France; Oct. 16, '39; for chemicals; since May 27, '37.

429,251. Albert L. Chaney (Albert L. Chaney Laboratory), Glendale, Calif.; March 6, '40; for chlormercuriphenol; since Dec. 9, '39.

429,457. Rumford Chemical Works, Rumford, R. I.; March 11, '40; for sodium tetra phosphate ($Na_6P_4O_{13}$); since Jan. 15, '40.

429,525. General Chemical Co , New York, N. Y.; March 13, '40; for insecticides and fungicides; since various dates from 1900 to 1937 depending on particular compound.

429,222. Eastman Kodak Co., Rochester, N. Y.; March 5, '40; for dyes; since April 14, '38.

430,166-430,167. Abbott Laboratories, Inc., North Chicago, Ill.; March 30, '40; for product having properties of vitamin K; since March 5, '40.

430,698. George E Sherman Co., Inc., New York, N. Y.; April 12, '40; for detergent and dyeing agent for use in dyeing of textiles; since Nov. 15, '39.

429,398. The Dow Chemical Co., Midland, Mich.; March 9, '40; for thermoplastic synthetic resins; since May 13, '38.

390,585. Charles Henry Clark (Clarco System Co.), Los Angeles, Calif.; March 27, '37; for dyes; since March 5, '36.

427,371. General Motors Corp., Detroit, Mich.; Jan. 12, '40; for cleaning or flushing fluid; since Sept. 15 '38.

430,795. Parke, Davis & Co.; April 15, '40; for product for maintaining physiologic alkalinity of the blood and urine; since Dec. 3, '39.

430,436. Carbide & Carbon Chemicals Corp., New York, N. Y.; April 6, '40; for synthetic organic resins and plastics and products thereof; since August 12, '38.

419,055. Sixteen Millimeter Sound Films, Inc., Boston, Mass.; May 2, '39; for chemicals for use in developing and for reversal of photographic film; since Oct. 31, '38.

430,168. Abbott Laboratories, North Chicago, Ill.; March 30, '40; for product having properties of vitamin K; since March 5, '40.

430,385. Carbide & Carbon Chemicals Corp., New York, N. Y.; April 5, '40; for chemical compounds having various uses; since Jan. 17, '40.

429,966. Atlas Powder Co., Wilmington, Del.; March 26, '40; for wood stain; since Feb. 29, '40.

431,300. Eastern Allied Sales Corp., New York, N. Y.; April 27, '40; for synthetic rubber tubing; since Dec. 15, '40.

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A Complete Check—List of Products, Chemicals, Process Industries

Cellulose

Cellulose coating solvent composition. No. 2,204,963. Percy E. Joyce to Shell Development Company.

Process softening cellulosic materials and artificial fibers by use of condensation product of alkylolamine and members of group of higher fatty acids, their esters and anhydrides and acid halides, which has been after treated with an acid. No. 2,205,042. Samuel Lenher and Luther B. Arnold, Jr., to E. I. du Pont de Nemours & Co.

Process for rendering cellulose-containing material crease-resistant and products obtained thereby. No. 2,205,120. George Heberlein, Jr., Ernst Weiss, and Hans Hemmi, to Heberlein Paten Corporation.

Process for producing free cellulose fiber. No. 2,205,704. George M. von Hassel.

Manufacture of acetyl cellulose. No. 2,206,288. Carl J. Malm to Eastman Kodak Company.

Method for the purification of cellulose ethers. No. 2,207,076. Harold M. Spurlin to Hercules Powder Co.

Chemical Specialty

Sheet material having glossy translucent moisture proof coating comprising eutectic mixture of metallic soaps. No. 2,204,550. John D. Murray to The Murray Liquafilm Corporation.

Unfired refractory insulation and method of manufacture. No. 2,204,581. Paul S. Denning to F. E. Schundler & Co., Inc.

Improvement in producing oxidized soluble starch conversion product. No. 2,204,615. Walter A. Nivling.

Preparation shaped catalyst by mechanical pressing. No. 2,204,619. Mathias Pier and Eugen Anthes to I. G. Farbenindustrie Aktiengesellschaft.

Method treating packing house waste to recover protein. No. 2,204,703. Marion D. Sanders to Industrial Patents Corporation.

Process stabilizing food against oxidative action. No. 2,204,728. Carleton Ellis and Frederic Dannerth to Ellis Laboratories, Inc.

Treatment of partially rancid glycerides to obtain substantially now rancid edible glyceride. No. 2,204,729. Carleton Ellis and Frederic Dennerth to Ellis Laboratories, Inc.

Mastic floor tile composition comprising filler, and thermo-plastic binder produced by distillation of oil from pure still residues resultant from fractionation of light oil from coke ovens. No. 2,204,773. Joseph Rivkin and Robert C. Scheib to The Neville Company.

Method protecting coal and the like by a congealable coating agent. No. 2,204,781. George M. Wattles.

Composition of matter suitable for use as flocculation agent comprising ferric chloride as major constituents and about .5-10% $TiCl_4$. No. 2,204,812. Irving E. Muskat to Pittsburgh Plate Glass Company.

Process making decorative fabric of woven glass fibers. No. 2,204,859. Charles S. Hyatt and John C. Lowman to Columbus Coated Fabrics Corporation.

Process for producing improved coffee extract. No. 2,204,896. William Kappenberg to Coffee Products Corporation.

Baked molded product of sufficiently high tensile strength to be used as a core for metal casting purposes. No. 2,204,913. Allan B. Ruddle.

Sintered binding agent of the Portland cement type and process for manufacturing same. No. 2,204,959. Gerhard Frenkel.

Apparatus for producing activated carbonaceous materials. No. 2,205,011. Oswald Heller.

Method forming compact mass of comminuted oxides into briquettes. No. 2,205,043. George S. Mican, Ralph H. Steinberg and Stephen F. Urban.

Method introducing ignition charge onto filament of electric blasting initiator. No. 2,205,081. Lawton Arthur Burrows and Clifford Akeley Woodbury to E. I. du Pont de Nemours & Co.

Silver polish. No. 2,205,115. Delbert F. Brown and Hugh C. DeHoff to Standard Oil Development Company.

Preparation of sulfur-containing Diesel fuel ignition agents. No. 2,205,126. Clarence H. Seeley & Maurice H. Arveson to Standard Oil Company.

Process manufacturing sugar product in granule form. No. 2,205,177. John W. Schlegel and Louis Lang to The National Sugar Refining Company.

Methods of tempering glass articles and bath therefore. Nos. 2,205,180-2,205,181. William W. Shaver to Corning Glass Works.

Hydraulic fluid comprising normally liquid N-substituted aliphatic acid amide, and aliphatic alcohol, and liquid obtained by alcoholysis of an oil from animal and vegetable group. No. 2,205,183. John C. Woodhouse to E. I. du Pont de Nemours & Co.

Insect repellent containing a thiuram sulfide as active ingredient. No. 2,205,232. Wendell H. Tisdale and Ira Williams to E. I. du Pont de Nemours & Co.

Abrasive article comprising abrasive grains bonded partially with acetal of a polymerized vinyl ester. No. 2,205,276. Norman P. Robie to The Carborundum Co.

Improvement in filtering liquid by use of finely divided pyrophyllite and a coarser fibrous material. No. 2,205,331. William H. Alton to R. T. Vanderbilt Co.

Method treating sugar syrup or melt to produce substantially colorless product, the improvement comprises treating washed sugar with calcium hypochlorite, one of the phosphates of sodium and thereafter with purifying carbon. No. 21,498. Daniel V. Wadsworth and Leonard Wickenden to John J. Naugle.

Fluorescent hydrocarbon oil. No. 2,205,408. Heinrich Hopff and Hans Schoenherr to General Aniline & Film Corporation.

Moistureproofing composition suitable for use in moistureproofing nonfibrous transparent cellulosic sheets or films. No. 2,205,428. James A. Mitchell to E. I. du Pont de Nemours & Co.

Adhesive abrasive composition. No. 2,205,438. Henry O. Richter to Norton Company.

Concentration of comminuted materials from their mixtures. No. 2,205,503. William Trotter and Eltoft Wray Wilkinson to Minerals Separation North American Corporation.

Method of preserving the catalytic activity of a metallic nickel hydrogenation catalyst. No. 2,205,552. Herrick R. Arnold to E. I. du Pont de Nemours & Co.

Improved cyclic process for generating oil gas. No. 2,205,554. Morris M. Brandegee and Charles E. Hemminger to Combustion Utilities Corporation.

A sterilizer comprising a 2,5-dioxo-Δ^3-pyroline. No. 2,205,558. Lawrence H. Flett to National Aniline and Chemical Co.

Manufacture of silicate-clay suspensions. No. 2,205,609. James G. Vail and Chester Leon Baker to Philadelphia Quartz Company.

Method stabilizing edible fats and oils against oxidation. No. 2,205,620. Ernest C. Crocker to Arthur D. Little, Incorporated.

Porous insulating materials comprising viscose solution, refractory material and finely divided gas generating substance selected from group consisting of metals, metal alloys, and metal carbides, said substance being able to generate a gas in form of fine bubbles by chemical interaction with said viscose solution. No. 2,205,734. Philip C. Scherer, Jr.

Composition of matter for the production of insulating materials. No. 2,205,735. Philip C. Scherer, Jr.

Method inhibiting corrosion in a metal container. No. 2,205,754. William J. Sweeney & Emile L. Baldeschwieler to Standard Oil Development Co.

Method bleaching wood. No. 2,205,770. Lawrence R. Van Allen.

Insecticidal composition including a reaction product of hydrofluosilicic acid and guanidine. No. 2,205,789. Ludwig J. Christmann & David W. Jayne, Jr., to American Cyanamid Co.

Plant growth stimulant. No. 2,205,807. Johan Bjorksten.

Luminescent material consisting principally of cadmium oxide and silica in substantially the proportions required to produce $CdSi_2O_5$ together with quantity of a metal which serves as a luminescence exciting agent and a small % of a K compound. No. 2,205,815. Ted E. Foulke to General Electric Co.

Process of manufacturing vermicelli. No. 2,205,834. Chua Tiong Him.

Production of iodized salt having uniform and homogeneous characteristics. No. 2,205,872. Robert E. Berry to Morton Salt Co.

Fat soluble vitamin concentrate. No. 2,205,925. Kenneth C. D. Hickman to Distillation Products, Inc.

In production of aqueous emulsions, suspensions and dispersions, an improvement comprising forming a mixture of one of said substances with an aqueous medium in presence of alkyl phenol sulfonate. No. 2,205,950. Lawrence H. Flett to National Aniline & Chem. Co., Inc.

Process of refining animal and vegetable oils. No. 2,205,971. Benjamin Clayton & Benjamin H. Thurman to Refining, Inc.

Pipe thread lubricant comprising an oil and powdered zinc which normally tend to deteriorate and form gas on standing and small amount of nitrobenzene to stabilize said composition against such gas formation. No. 2,205,990. Roy F. Nelson & William S. Hurwitz to The Texas Company.

Manufacture of polyvalent metal soaps. No. 2,205,994. Charles C. Towne to The Texas Company.

Manufacture of polyvalent metal soaps. No. 2,206,002. Alton J. Deutser & Roy F. Nelson to The Texas Company.

Carbon solvent and lubricant. No. 2,206,025. Roy L. Buffington and Philip H. Elliott to Carsolac Corporation.

Film cast from aqueous, alkaline, cellulosic solution, said film having a size thereon consisting of water-insoluble amide. No. 2,206,046. John D. Pollard, to E. I. du Pont de Nemours & Co.

Method forming fine glass fiber. No. 2,206,058. Games Slayter & John H. Thomas to Owens-Corning Fiberglas Corporation.

Method and apparatus for fiberizing vitreous material. No. 2,206,060. Games Slayter to Owens-Corning Fiberglas Corporation.

Emulsion breaking reagent and method of preparing the same. No. 2,206,062. James G. Suthard.

Method treating ales and beers to increase resistivity to effects of light, heat, and oxidation reaction. No. 2,206,066. Leo Wallerstein.

Photographic silver halide emulsion. No. 2,206,076. Burt H. Carroll to Eastman Kodak Co.

Glass resulting from fusion of glass batch consisting of oxides of lanthanum, tantalum, thorium and boron. No. 2,206,081. Leon W. Eberlin to Eastman Kodak Company.

Acidic waterproofing composition. No. 2,206,090. John E. Haggenmacher to Warwick Chemical Co.

Protection of autooxidizable materials. No. 2,206,113. Ferdinand W. Nitardy to E. R. Squibb & Sons.

Process for making corrected magnesia refractories. No. 2,206,131. Gilbert E. Seil to E. J. Lavino & Company.

Method producing a fixed combustible gas. No. 2,206,189. Charles B. Hillhouse to Sylvia Remsen Hillhouse.

Process of removing materials containing phosphatides from vegetable oils. No. 2,206,210. Benjamin H. Thurman to Refining, Inc.

Refractory material for use in basic process siderothermic furnaces. No. 2,206,277. Giovanni Battista Crespi.

Luminescent silicate material having incorporated therein .001-.05% of arsenic based on weight of SiO_2 No. 2,206,280. Herman C. Froelich to The Harshaw Chemical Company.

Method and means for detecting presence of sugar in a solution. No. 2,206,282. Herman Jacobius.

Stable hydrous, alkaline silicates. No. 2,206,289. George R. McDaniel to Diamond Alkali Co.

Method etching photomechanical printing plate. No. 2,206,290. Albert G. Meyer to Harold M. Pitman Company.

Treatment of zein solutions to prevent denaturing. No. 2,206,310. Lloyd Clayton Swallen to Corn Products Refining Company.

Method enriching vitamin content and preserving ground coffee. No. 2,206,319. Fred Geitz, Jr.

Method decolorizing liquids comprises contacting colored liquid with mass of granular adsorbent decolorizing material. No. 2,206,337. Edwin G. Steele, deceased, Bess Ryan Steele, executrix.

Process extracting juice from sugar cane. No. 2,206,341. Armando S. Villaususo.

Production substantially stable casein solutions. No. 2,206,357. Theodoor Koch to American Enka Corporation.

Weed destroying composition comprising quantity of powdered arsenic salt, caseinate salt and hydrocarbon oil. No. 2,206,470. Wellington Lee Tanner & Clifford A. Parish.

Manufacture of pasteurized potato salad. No. 2,206,483. Ellis R. Meaker to Ivanhoe Foods, Inc.

Composition for treating skin diseases of hirsuite animals. No. 2,206,-

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520. Wendell H. Tisdale & Albert L. Flenner to E. I. du Pont de Nemours & Co.

Process for making insulating materials. No. 2,206,557. Willard H. Bennett.

Method toning photographic material with ferricyanides. No. 2,206,572. Roy Horst Landis to American Cyanamid Co.

Petroleum demulsifying reagent and process. No. 2,206,589. Truman B. Wayne.

Process of degrading protein products. No. 2,206,622. Charles Weizmann.

Process for the production of radioactive substances. No. 2,206,634. Enrico Fermi, Edoardo Amaldi, Bruno Pontecorvo, Franco Rasett, & Emilio Segra to G. M. Giannini & Co., Inc.

Composition of matter capable of being cured by heat comprising a tetramethyl thiuram sulfide incorporated with reaction product of an alkaline polysulfide and an organic compound having a substituent attached to each of two terminal carbon atoms which substituent is split off during the reaction. No. 2,206,642. Joseph C. Patrick to Thiokol Corp.

Organic polysulfide cement and process of making the same. No. 2,206,643. Joseph C. Patrick to Thiokol Corp.

A catalyzer for treatment of heavy and light hydrocarbons and the like. No. 2,206,685. Dimitri Balachowsky.

Apparatus for applying decorative color effects to glass and ceramic ware. No. 2,206,686. Thomas S. Bauman to Classic Glass, Inc.

Viscose cement. No. 2,206,692. Jack W. Garrison to Transparent Package Co.

Process for making a fermented liquor. No. 2,206,719. Richard M. Draeger.

Method classifying slurry. No. 2,206,721. Johan Sigismund Fasting to F. L. Smidth & Co.

Parasiticidal preparation containing as active ingredient a product of reaction of acetonyl acetone with ammonium thiocyanate. No. 2,206,758. William P. ter Horst to United States Rubber Co.

Method producing catalytically active septa which are permeable to hydrogen. No. 2,206,773. William J. Hale.

Electrical resistance material suitable for use in lightning arresters, over voltage protective devices and the like, and method of making same. No. 2,206,792. Bertil Stalhane.

Antiseptic preparation comprising a furan mercurial. No. 2,206,804. Robert R. Burtner to G. D. Searle & Co.

Antiseptic preparation for use in contact with human tissue comprising furylmercuric chloride. No. 2,206,805. Robert R. Burtner to G. D. Searle & Co.

Prolamin solutions and method of preparing same. No. 2,206,819. Jerome Martin to Commercial Solvents Corporation.

Process for treating moist plasticized casein in form of sheets and strips. No. 2,206,850. John A. Parsons to American Plastics Corp.

Step of further de-watering solids in process of stabilizing sewage by action of molds and fungi. No. 2,206,851. Clyde Potts & Chester G. Wigley—said Wigley to said Potts.

Method of making waterproof newspapers. No. 2,206,868. Glenn Dean Morgan.

Method of making pressure-sensitive adhesive sheets. No. 2,206,899. Waldo Kellgren to Minnesota Mining & Manufacturing Co.

Stomach poison for combating insects and animals comprising particle of toxic substance provided with substantially water insoluble edible organic coating non-repellent to the insect or animal. No. 2,206,975. Walter E. Ripper.

Process of making edible coating for frozen products. No. 2,207,034. Robert C. Vogel, Robert W. Coblents and William A. Capstick.

Gum inhibitors and stabilized hydrocarbon compositions containing them. No. 2,207,063. Thomas R. Liston to National Aniline & Chemical Company, Inc.

Preparation of refractory material. No. 2,207,072. Gilbert E. Seil to E. J. Lavino & Co.

Dentifrice capable of generating O_2, comprises perborate and acid reacting aluminum sulfate. No. 2,207,074. Nathan Smith.

Method making substantially smooth parchmentized kraft paper. No. 2,207,122. Ralph A. Hayward to Kalamazoo Vegetable Parchment Company.

Method of activating natural earths. No. 2,207,145. Richard Doht to Aktiengesellschaft Dynamit Nobel.

Artificial bristles. Nos. 2,207,156-2,207,157-2,207,158. Harvey A. Neville & William C. Forbes to Devoe & Raynolds Co., Inc.

Preparation of insecticidal materials from alkaloids and pectic acid. No. 2,207,185. Clarence Walter Wilson to California Fruit Growers Exchange.

Composition for use in waving hair with hair softening agent, said composition comprising water soluble soap, degraded glyceride of a higher fatty acid and inert organic solvent of hydroxy-ether type. No. 2,207,241. Gifford D. Davis to National Oil Products Company.

Emulsifying composition comprising a soap, a degraded glyceride of a higher fatty acid and a glycol solvent, molal ratio of soap to degraded glyceride being at least 1. No. 2,207,256. Roland Kapp to National Oil Products Company.

Low sugar content jelly formed by aid of an insoluble alkaline-earth metal pectate, a dispersing agent and a food acid. No. 2,207,299. Nathan M. Mnookin to Speas Company.

Method of handling and cooking food particles in liquid cooking baths. No. 2,207,316. Joseph D. Ferry, deceased, to executrix Sylvia O. Ferry.

Improvement in manufacture gypsum-core wallboard comprises step of incorporating soluble, colloidally modified starch with calcined gypsum slurry. No. 2,207,339. Thomas P. Camp to U. S. Gypsum Co.

Therapeutical preparation for the peroral treatment of hay fever and a method for the manufacture of same. No. 2,207,415. Kurt Rosenwald.

Composition including a paint with drying oil base, quantity of water substantially equal to volume of paint, and quantity of lime water approximately equal to $^1/_{80}$ part of volume of said paint. No. 2,207,429. Frank L. Bullard to Stephen Wojnowski.

Dry pulverulent insecticide, fungicide, and germicide composed of barium sulfide and tobacco. No. 2,207,482. Roy H. Ellis.

High melting point silicate refractory. No. 2,207,557. Gilbert E. Seil to E. J. Lavino & Co.

Method removing fluorescence from fluorescent aqueous alkali metal hydroxide. No. 2,207,566. William F. Waldeck & Richard J. Ketterer to Pittsburgh Plate Glass Company.

Electrical treatment of water to prevent the effects of hardness. No. 2,207,583. Albert George Freeborn.

Process of decreasing reflection of light from surfaces, and articles so produced. No. 2,207,656. Charles Hawley Cartwright & Arthur Francis Turner to Research Corporation.

As new composition, a fatty oil containing minor amount of oxidized hydrocarbon capable of catalyzing polymerization of said oil. No. 2,207,686. Alexander Schwarcman to Spencer Kellogg & Sons, Inc.

Insecticide preparation containing reaction product of pectic acid and volatile poisonous alkaloid. No. 2,207,694. Willard E. Baier to California Fruit Growers Exchange.

Coal Tar Chemicals

Plastic composition produced as insoluble residue of treatment of pure still residue, resultant from fractionation of light oil from coke ovens. No. 2,204,772. Joseph Rivkin and Robert C. Scheib to The Neville Company.

Method of making coke from hydrocarbon residues. No. 2,205,631. Albert P. Sachs to Petroleum Conversion Corporation.

Process for the production of conversion products from carbonaceous materials. No. 2,206,007. Otto Liebknecht to The Permutit Co.

Recovery of tar acids or phenols from tars or tar oils. No. 2,206,198. Vittorio Molinari to Bakelite Corp.

Process for cracking and hydrogenating bituminous oils. No. 2,206,200. Ernest A. Ocon.

Low temperature hydrogenation process for production of valuable hydrocarbon products from distillable carbonaceous materials. No. 2,206,729. Mathias Pier & Walter Kroenig to Standard-I. G. Co.

Production of aminoanthraquinone compounds. No. 2,207,045. Richard S. Wilder to National Aniline & Chemcial Co., Inc.

Process and apparatus for the hydrogenation of carbonaceous materials. No. 2,207,494. Vaclav Viktora, to Ceskoslovenske tovarny na disikate latky ake. spol./Czechoslovakian Nitrogen Works Co., Ltd.

Coatings

Reissue. Liquid coating composition containing cellulose derivative. No. 21,485. Harry M. Weber to Ellis-Foster Co.

Flat, non-burnishing coating composition comprising cellulose derivative and flattening agent consisting of silica gel. No. 2,204,981. John Waldo Clough to E. I. du Pont de Nemours & Co.

Polystyrene coating composition. No. 2,207,623. Toivo A. Kauppi & Kenneth D. Bacon to The Dow Chemical Co.

Dyes, Stains, Etc.

Aza compounds and process for coloring therewith. No. 2,204,607. James G. McNally and Joseph B. Dickey to Eastman Kodak Company.

Dyestuffs of the anthraquinone series. Nos. 2,204,741-2,204,742. Alexander J. Wuertz and William L. Rintelman to E. I. du Pont de Nemours & Co.

Acid wool dyestuffs comprising 1-hydroxy 2-arylaminoanthraquinones. No. 2,204,748. Edwin C. Buxbaum to E. I. du Pont de Nemours & Co.

Anthraquinone dyestuffs. No. 2,204,749. Samuel Coffey, Norman Hulton, Haddock and Clifford Wood to Imperial Chemical Industries Limited.

Process producing dyeings by means of water-soluble acyl derivatives of sparingly soluble dyestuffs. Nos. 2,204-932-2,204,933. Charles Graenacher to Society of Chemical Industry in Basle.

Monoazo dyestuffs insoluble in water. No. 2,204,958. Ernst Fischer to General Aniline & Film Corporation.

Dyestuff intermediates of the anthraquinone series. No. 2,204,970. William L. Rintelman to E. I. du Pont de Nemours & Co.

Vat dye containing penetrating agent having general formula $(R_1OOC)n(COOM)n$, R is aromatic hydrocarbon radical, R_1 is hydrocarbon radical, M is of group consisting of hydrogen and water-soluble salt-forming groups and n is integer not greater than 3. No. 2,205,032. Ivan F. Chambers and Arthur L. Fox to E. I. du Pont de Nemours & Co.

Composition of matter comprising an intermediate adapted to form an insoluble azo dye by coupling reaction and soluble salt of non-foaming acid alkyl ester of an inorganic polybasic acid. No. 2,205,416. Jean G. Kern to National Aniline & Chemical Company, Inc.

Monoazo dyestuffs producing red to blue black shades and yielding scarlet to dark blue if dyestuff is diazotized on fiber and coupled with itself by addition of an agent that neutralizes the acid or has an alkaline action. No. 2,205,481. Herbert Kracker and Willy Schumacher to General Aniline & Film Corporation.

Ice color producing composition. No. 2,205,663. Hans Z. Lecher, Robert P. Parker, and Henry Philip Orem to American Cyanamid Co.

Stable ice color producing composition. Nos. 2,205,795-2,205,796. Hans Z. Lecher, Frederic H. Adams & Henry Philip Orem to American Cyanamid Co.

Monoazo dyestuffs soluble in water. No. 2,205,848. Erich Fischer to General Aniline & Film Corp.

Azo dyestuffs soluble in water. No. 2,205,849. Erich Fischer, Otto Lang and Arthur Siebert to General Aniline & Film Corp.

Vat dyestuffs of the anthraquinone series. No. 2,205,855. Karl Kuppe to General Aniline & Film Corporation.

Method inhibiting reduction of reducible dyes on textile material which comprises treating a textile material having a reducible dye applied thereto with a nitro-aralkyl side-chain sulfonate. No. 2,205,887. Jean G. Kern to National Aniline & Chemical Co.

A diazotype process. No. 2,205,991. Wilhelm Neugebauer & Oskar Sus to Kalle & Co.

Azo compounds and fiber dyed therewith. No. 2,206,099. James G. McNally & Joseph B. Dickey to Eastman Kodak Company.

Dyestuffs of the methine series. No. 2,206,108. Werner Müller & Carl Berres to General Aniline & Film Corporation.

Vat dyestuffs of the anthraquinone series. Nos. 2,206,127-2,206,128. Otto Schlichting to General Aniline & Film Corporation.

Diketone coupler compounds for color forming photographic developer. No. 2,206,142. Paul W. Vittum & Willard D. Peterson to Eastman Kodak Co.

Oxazines of the anthraquinone series and process of preparing them. No. 2,206,610. George Kranzlein, Ernst Diefenbach & Fritz Eggert to General Aniline & Film Corp.

Method of applying azo dyestuffs to fibers by development under the effect of light. No. 2,206,611. Robert Lantz, one-half to Societe Anonyme des Matieres Colorantes & Produits Chimiques de Saint-Denis.

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Coloring material and method of applying same. No. 2,206,722. Paul Fidelman to Joseph Dixon Crucible Co.

Azo compounds and process for coloring therewith. No. 2,206,885. Joseph B. Dickey to Eastman Kodak Co.

Azo dye having general formula: R—N=N—R_1 where R is residue of a phenyl-alkyl ketone and R_1 a member selected from group consisting of an aryl nucleus of benzene and naphthalene series, a hydroaromatic nucleus. No. 2,206,911. James G. McNally & Joseph B. Dickey to Eastman Kodak Company.

Equipment and Apparatus

Apparatus for the recovery of salts from aqueous solutions. No. 2,204,777. Elias Anthon Cappelen Smith to Guggenheim Brothers.

Device for measuring temperature of a moving heated strand. No. 2,204,797. Richard L. Fearn to Syncro Machine Company.

Gas analyzing apparatus. No. 2,204,966. John D. Morgan and Alan P. Sullivan to Power Patents Company.

Means of commingling fluids. No. 2,205,284. William R. Eckart to C. F. Braun & Co.

Extruding machine for clay, soap, and other plastic materials. No. 2,205,328. Arnold Frank Wills to W. & F. Wills, Limited.

Temperature control of catalytic operations. No. 2,205,409. Eugene J. Houdry to Houdry Process Corporation.

Method and apparatus for separating solids of different gravities. No. 2,205,432. Frank Pardee to Anthracite Separator Company.

Apparatus for moving farinaceous or pulverous materials by means of compressed air. No. 2,205,525. Paul Goebels, deceased, by Lina Goebels.

Pressure vessel for compressed oxygen or oxygen-containing gases. No. 2,205,708. Emil Zurbrugg to Aluminum-Industrie-Aktien-Gesellschaft.

Apparatus for cracking oil. Nos. 2,205,765-2,205,766. Carl E. Kleiber to Standard Oil Development Co.

Fermentation vat and lining therefor. No. 2,206,421. Richard Muehlhofer.

Apparatus for exposing liquids to direct contact with air or gases. No. 2,206,440. George Henry Walker to Heenan & Froude Limited.

Method and apparatus for continuous counter-current solvent extraction of solid materials. No. 2,206,595. Michele Bonotto to Extractol Process Ltd.

Apparatus for measuring and delivering gas quantities reduced to a normal condition. No. 2,206,618. Paul Rheinlander to Askania-Werke A. G. vormals Central Werkstatt Dessau und Carl Bamberg-Friedenau.

Lime-zeolite water-softening process. No. 2,206,691. Reginald Furness & Harold Joseph Wheaton to Joseph Crosfield & Sons, Ltd.

Method and apparatus for salvaging liquid egg material. No. 2,206,959. John C. Irish.

Process and apparatus for breaking eggs and salvaging liquid egg material No. 2,206,960. John C. Irish.

Heat exchanger. Nos. 2,207,036-2,207,037. George T. Jacocks to The Lummus Co.

Apparatus for breaking down coal in a mine by suddenly releasing into coal a highly compressed gaseous charge of CO_2 which has been confined as a liquid and converted to a gas by application of intense heat. No. 2,207,191. Eric Geertz to Cardox Corporation.

A defibrating machine for manufacture and refining of pulp. No. 2,207,194. William P. Gruendler; one-fifth to Charles D. Altick, and one-fifth to Lloyd D. Smiley.

Cooling tower construction. No. 2,207,272. Edward W. Simonds to Redwood Manufacturers Co.

Apparatus for raising liquids by means of compressed air. No. 2,207,318. Detlev Gollner.

Apparatus for separating materials of different specific weights. No. 2,207,326. Rudolf Maier.

Water softening plant. No. 2,207,327. Marion F. Maurer.

Crystallizing evaporator. No. 2,207,347. Burton S. Hughes to Zaremba Company.

Extrusion process and apparatus. No. 2,207,405. Eugene Jacobson.

Explosives

Propellant charge comprising double base powder wherein nitroglycerin is one of the base constituents and a non-explosive primer including red phosphorous. No. 2,206,048. Ernest R. Rechel & Thomas Stevenson.

A percussion and heat sensitive explosive composition comprising as active ingredient a metal salt of trinitrosophloroglucinol. A primer composition comprising a metal salt of trinitrosophloroglucinol and a lead salt of a nitrophenolic compound. No. 2,206,652. William B. Woodring to Western Cartridge Co.

In art of making propellant powder grains, process of comminuting gelatinized nitrocellulose containing unstable regions, so as to form fine particles and treating the nitrocellulose with a solvent in presence of protective colloid. No. 2,206,916. Fredrich Olsen, Gordon C. Tibbitts & Edward B. W. Kerone to Western Cartridge Co.

Fine Chemicals

Sulfonated indol derivatives of high capillary activity characterized by capacity for emulsifying lime-soaps. No. 2,204,544. Kurt Engel to J. R. Geigy.

Preparation of cyclohexene. No. 2,204,565. Edgar C. Britton, Robert C. Dosser and John J. Sculati to The Dow Chemical Company.

Aliphatic di-oxymethylene quaternary ammonium halides and process for producing them. No. 2,204,653. Louis H. Bock to Rohm & Haas Company.

Process comprising causing a salt of 3',4'-dihalogen-benzoyl-2-benzoic acid to react with a sulfite in solution. No. 2,204,960. Sebastian Gassner and Berthold Bienert to General Aniline & Film Corporation.

Process separating sulfonating agent from organic sulfonates. No. 2,204,969. Joseph Henry Percy to Colgate-Palmolive-Peet Company.

Production of capillary-active sulfonium sulfates. No. 2,204,976. Adrianus Johannes Van Peski and Johan Marius Hoeffelman to Shell Development Company.

Diamidino stilbenes and process of making them. No. 2,204,983. Arthur James Ewins and Julius Nicholson Ashley to May & Baker, Limited.

Process neutralizing higher aliphatic alcohol sulfuric acid ester. No. 2,205,037. Clyde O. Henke and Roland G. Benner to E. I. du Pont de Nemours & Co.

Preparation of acylated 3-hydroxy-bis-nor cholenic acids. No. 2,205,045. James Robertson Myles to Imperial Chemical Industries Limited.

Preparation of long-chain aliphatic mononitriles. No. 2,205,076. Charles G. Wortz to E. I. du Pont de Nemours & Co.

Lead salt of 4-nitro phthalic acid and deflagrating composition comprising as an ingredient a lead salt of 4-nitro-phthalic acid. No. 2,205,116. Willi Brün to Remington Arms Co., Inc.

Preparation metal chromite catalyst. No. 2,205,140. Llewellyn Heard to Standard Oil Company.

Purification of halogenated hydrocarbons. No. 2,205,187. Frank M. Clark to General Electric Company.

1.4 alkyl amino anthraquinone. No. 2,205,191. Julius Flaks to American Cyanamid Company.

Process for preparing cyano-2-butadiene-1,3. No. 2,205,239. Albert S. Carter and Frank Willard Johnson to E. I. du Pont de Nemours & Co.

Reaction products of ortho-phosphitabenzoyl chloride and method of making same. No. 2,205,337. Henry G. Berger and William H. James, and Darwin E. Badertscher to Socony-Vacuum Oil Co.

(Alkyl-halo-phenoxy)-halo-dialkyl ethers. No. 2,205,392.2 Gerald H. Coleman and Clarence L. Moyle to The Dow Chemical Company.

(Halo-phenoxy-halo-dialkyl ethers.) No. 2,205,393. Gerald H. Coleman & Clarence L. Moyle to The Dow Chemical Company.

2-chloroallyl ethers of phenols. No. 2,205,395. Gerald H. Coleman to The Dow Chemical Company.

Manufacture of maleic anhydride. No. 2,205,402. Harold B. Foster and Joyce H. Crowell to National Aniline & Chemical Company, Inc.

Nitrosamine addition product. No. 2,205,417. Jean G. Kern to National Aniline & Chemical Company, Inc.

Process for the preparation of dichlorindanthrone. No. 2,205,418. Francis Knowles and William Hiram Lycan to E. I. du Pont de Nemours & Co.

Isomer of cholesterol and process for producing the same. No. 2,205,448. Everett S. Wallis and Erhard Fernholz to Merck & Co., Inc.

Aralkyl ethers of high molecular carbohydrates. No. 2,205,487. Karl Meinel to Hercules Powder Company.

A beta-(ortho-hydroxyphenyl)-isopropylamine of formula $HO\text{-}C_6H_4\text{-}CH_2\text{-}CH(NHR)\text{-}CH_3$. R being of group consisting of hydrogen, lower alkyl, and cycloalkyl radicals. No. 2,205,530. Gustav Hildebrandt to E. Bilhuber, Inc.

Esters of unsaturated polyhydroxy estrane. No. 2,205,627. Karl Miescher and Caesar Scholz to Society of Chemical Industry in Basle.

Process of manufacturing amino ketones. No. 2,205,728. Henry Martin & Rudolf Hirt to J. R. Geigy A G.

Polynuclear condensation products and their production. No. 2,205,763. Heinrich Hopff and Hans Schoenherr to General Aniline & Film Corp.

Preparation of acetylenic acids. No. 2,205,885. Donald R. Jackson & Thomas H. Vaughn to Union Carbide & Carbon Research Labs.

Liquid mineral oil sulfonates and process of manufacture. No. 2,205,924. Alfred Putnam Frame to Charles E. Foster & Ernest V. Moncrieff.

Alkyl phenol sulfonates. No. 2,205,946. Lawrence H. Flett to National Aniline & Chemical Co., Inc.

Nuclear alkyl derivatives of phenol compounds. No. 2,205,947. Lawrence H. Flett to National Aniline & Chemical Co, Inc.

Primary alkyl phenol sulfonates. No. 2,205,948. Lawrence H. Flett to National Aniline & Chemical Co., Inc.

Alkyl hydroxy aromatic. No. 2,205,949. Anthony M. Schwartz to National Aniline & Chemical Co., Inc.

Method of producing nuclear alkyl derivatives of phenols. No. 2,205,951. Jack D. Robinson to National Aniline & Chemical Co., Inc.

Process for refining camphor. No. 2,205,954. Clyde O. Henke & Gastao Etzel to E. I. du Pont de Nemours & Co.

Production of amino carboxylic acid nitriles. No. 2,205,995. Heinrich Ulrich & Ernst Ploetz to I. G. Farbenindustrie Aktiengesellschaft.

Method preparing aminotriazines comprises heating dicyandiamide in non-aqueous liquid medium in presence of 5.25% of its weight of an alkali stronger than ammonia. No. 2,206,005. John M. Grim to American Cyanamid Co.

Process of manufacturing fatty esters containing unesterified hydroxyl groups. No. 2,206,167. August Edeler & Albert S. Richardson to The Procter & Gamble Co.

Process for manufacturing fatty esters consisting of monoglycerides and diglycerides. No. 2,206,168. August Edeler & Albert S. Richardson to The Procter & Gamble Company.

Unsaturated acid glycol resin complex and process of making same. No. 2,206,171. Carleton Ellis to Ellis-Foster Company.

Process of preparing a cadmium metaphosphate catalyst. No. 2,206,226. Walter Henry Groombridge & Thomas Pride Dee to Celanese Corporation of America.

Agents of capillary action from alkyl-amino-carboxylic acids with tertiary or quaternary bound nitrogen. No. 2,206,249. Karl Kaimler, Carl Platz & Fritz Bücking & Johann Rosenbach to General Aniline & Film Corporation.

Production ethylene imines comprises treating mono-ethylol amine sulfuric acid ester at temp. 50-200° C. with dispersion of substance selected from alkali and alkaline earth metal hydroxides. No. 2,206,273. Heinrich Ulrich to I. G. Farbenindustrie Aktiengesellschaft.

Concentrated aqueous solutions of the ammonium salts of disubstituted dithiophosphoric acids. No. 2,206,284. David W. Jayne, Jr., to American Cyanamid Company.

Zirconium oxide and method of making same. No. 2,206,287. Charles J. Kinzie & Donald S. Hake to The Titanium Alloy Manufacturing Company.

Process of preparing pyridylmercuric salts. No. 2,206,309. Randolph Norris Shreve & Maxwell James Skeeters to Mallinckrodt Chemical Works.

Method of making levulinic acid. No. 2,206,311. Alva Thompson to Corn Products Refining Company.

Preparation of aliphatic acid nitriles. No. 2,206,351. Richard Greenhalgh to Imperial Chemical Industries, Limited.

Preparation starch amines soluble in dilute aqueous acid. No. 2,206,354. Albert Aubrey Houghton to Imperial Chemical Industries, Limited.

Art of synthesizing compounds of the ascorbic acid series. No. 2,206,374. Irwin Stone to Wallerstein Company, Inc.

Method for catalytic production of maleic acid from benzene. No. 2,206,377. John M. Weiss to The Calorider Corp.

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Preparation of pentaerythritol. No. 2,206,379. Joseph A. Wyler to Trojan Powder Co.

Method of preparing alkaloids from "tamasakitsuzurafuji" (stephania cepharantha, havata) of the menispermaceae family. No. 2,206,407. Heisaburo Kondo, Shuji Hasegawa & Masao Tomita.

Halogenating nitroaminobenzene sulfonic acid. No. 2,206,510. Georg Matthaeus to General Aniline & Film Corp.

Process for the separation of trimethylamine from mixtures of trimethylamine and monomethylamine. No. 2,206,584. Le Roy U. Spence to Rohm & Haas Co.

Process for the separation of trimethylamine from mixtures of trimethylamine and dimethylamine. No. 2,206,585. Le Roy U. Spence to Rohm & Haas Co.

Production of aminotriazines. No. 2,206,603. George H. Foster to American Cyanamid Co.

Process comprising reacting an alkaline metallic tetrasulfide with a reactive methylene body. No. 2,206,641. Joseph C. Patrick.

N-alkyl-C-methyl-Barbituric acid compounds. No. 2,206,779. Walter Kropp & Ludwig Taub to Winthrop Chemical Co., Inc.

Process stabilizing crude carbohydrate derivatives. No. 2,206,872. Rudolph S. Bley to North American Rayon Corp.

Acetals of compounds of formula aryl-X-alkyl-OH wherein X is member of group consisting of O and S. No. 2,206,883. Kurt Desamari & Reinhard Hebermehl to I. G. Farbenindustrie Aktiengesellschaft.

Manufacture and treatment of organic materials comprising organic esters. No. 2,206,946. Henry Dreyfus.

Aminoaryl sulfones and their manufacture. No. 2,207,021. Henry Martin & Rudolf Hirt to J. R. Geigy A. G.

Process of converting compounds of the acetylene series into compounds of the ethylene series. Nos. 2,207,070-2,207,071. Walter Reppe, Alexander Rothhaas, Otto Schmidt, & Rolf Luehdemann to Jasco, Inc.

Production of allyl type halides. No. 2,207,193. Herbert P. A. Groll to Shell Development Co.

Manufacture of fatty esters. No. 2,207,257. Roland Kapp to National Oil Products Company.

Process decolorizing colored Ti Cl_4 by contacting vapors of said Ti Cl_4 with an adsorbent. No. 2,207,597. Alphonse Pechukas to Pittsburgh Plate Glass Co.

Manufacture of aliphatic aminosulfonic acids. No. 2,207,603. Hans Wesche to I. G. Farbenindustrie Aktiengesellschaft.

Separation of butylene-1 and isobutylene from mixtures containing same. No. 2,207,608. Edgar C. Britton, Howard S. Nutting & Lee H. Horsley to The Dow Chemical Co.

Purification of alkyl chlorides and formation of esters. No. 2,207,611. Gerald H. Coleman & Garnett V. Moore to The Dow Chemical Co.

Ethers of substituted acyl-phenols. No. 2,207,612. Gerald H. Coleman & John W. Zemba to The Dow Chemical Co.

Method reacting 2-methyl-allyl halide with alkali metal propionate to form 2-methyl-alkyl propionate. No. 2,207,613. Gerald H. Coleman & Garnett V. Moore to The Dow Chemical Co.

Process for the manufacture of ammonium dithiocarbamate. No. 2,207,627. Roger A. Mathes to The B. F. Goodrich Co.

Preparation ascorbic acids comprises reacting mesoxalic acid ester with glucose in presence of alkaline agent. No. 2,207,680. Burckhardt Helferich to Winthrop Chemical Co., Inc.

Industrial Chemicals

Process for the purification of sulfur dioxide-containing technical gases obtained from roasting. No. 2,204,543. Ernst Berl.

Process for dehydration of acetic acid and other lower fatty acids. No. 2,204,616. Donald F. Othmer to Tennessee Eastman Corporation.

Process for oxidation of alcohol. No. 2,204,652. Joseph E. Bludworth to Celanese Corporation of America.

Production of Cl2 by oxidation of HCL. No. 2,204,733. Hoke S. Miller to Air Reduction Co., Inc.

Cyclic process for generating chlorine and production of valuable byproducts. No. 2,204,888. Elmer E. Dougherty.

Process continuously producing gases from solid carbonaceous fuel and oxygen. No. 2,204,902. John U. McDonald.

Process for purification of methyl ethyl ketone which is contaminated and discolored by presence of diketone impurities. No. 2,204,956. Fritz Bresler and Albert Drasky to Shell Development Company.

Process for simultaneous production of cyclohexane and acetone comprises reacting isopropanol and benzene at elevated pres. & temp. in presence of catalyst. No. 2,204,978. Edward P. Bartlett to E. I. du Pont de Nemours & Co.

Continuous process preparing pure H_2S from gase mixture of H_2S and CO_2. No. 2,205,122. Sylvester Alton LeCroy to Standard Oil Development Company.

Process of differential flotation of mixed sulfide ore. No. 2,205,194. William D. Green to Combined Metals Reduction Company.

Process purifying lactic acid which contains cyanide. No. 2,205,256. Ivan L. Haag and Charles A. Vana to E. I. du Pont de Nemours & Co., Inc.

Reissue. Production aromatic hydrocarbons from aliphatic hydrocarbons of from 6-12 C atoms. No. 21,486. Aristid V. Grosse to Universal Oil Products Company.

Process separating stearine from refined cottonseed oil. No. 2,205,381. Eddey W. Eckey and Robert G. Folzenlogen to The Procter & Gamble Co.

Process polymerizing mixture of styrene and a 2-chloroallyl ester containing at least 2 ethylenic linkages. No. 2,205,390. Edgar C. Britton, Gerald H. Coleman and John W. Zemba to The Dow Chemical Co.

Process for the manufacture of formaldehyde by electrosynthesis from carbon monoxide and hydrogen. No. 2,205,542. Eloi Ricard to Les Usines de Melle.

Process isolating and recovering CO_2 from flue gases. No. 2,205,962. Gustave T. Reich.

Process producing alcohol from distillery slop. No. 2,206,024. Charles R. Brown to The Sharples Corporation.

Manufacture of acetaldehyde by hydration of acetylene. No. 2,206,227. Walter Henry Groombridge and Thomas Pride Dee to Celanese Corporation of America.

Production of substantially pure chlorine from gases containing hydrochloric acid. No. 2,206,399. William Mason Grosvenor, Jr., & Isador Miller to W. M. Grosvenor Laboratories, Inc.

Method for recovery of acetylene from gas mixtures. No. 2,206,490. Heinrich Tramm & Helmut Kolling to Ruhrchemie Aktiengesellschaft.

Absorption system for nitric acid. No. 2,206,495. Alling P. Beardsley & Robert H. Park to American Cyanamid Co.

Process for preparing solid paraffins. No. 2,206,500. Franz Fischer & Helmut Pichler to Hydrocarbon Synthesis Corporation.

In manufacture of hydrochloric acid the method of removing SO_2 and sulfuric acid mist. No. 2,206,528. Alvin A. Corey & Hallock C. Hosford to E. I. du Pont de Nemours & Co.

Process of nitrating hydrocarbons. No. 2,206,813. Henry B. Hass & Edward B. Hodge to Purdue Research Foundation.

Process of distilling liquor. No. 2,206,867. George Hureau.

Process and preparation of cyclopropane. Nos. 2,206,877-2,206,878. Walter G. Christiansen to E. R. Squibb & Sons.

Recovery of basic copper sulfate from rayon manufacture. No. 2,206,889. Sverre Gulbrandsen to New Process Rayon, Inc.

Process for preparing cyclopropane. No. 2,206,917. John M. Ort to E. R. Squibb & Sons.

Liquefaction and separation of gases. No. 2,206,967. Guido Maiuri.

Chemical treatment in the manufacture of ethyl alcohol. No. 2,207,111. Louis B. Rodenberg to National Distillers Products Corporation.

Electrolytic manufacture of copper carbonates. No. 2,207,308. Elbert Franklin Weaver to International Smelting & Refining Company.

Production SO_2 by combustion carbonaceous iron sulfide. No. 2,207,364. Albert W. Wahlgren to E. I. du Pont de Nemours & Co.

Process for catalytic conversion of CO with hydrogen into hydrocarbons. No. 2,207,581. Franz Dutfschmid & Eduard Linckh & Fritz Winkler to I. G. Farbenindustrie Aktiengesellschaft.

Process for removing chlorates from caustic solutions. No. 2,207,595. Irving E. Muskat to Pittsburgh Plate Glass Co.

Leathers and Tanning

Process filling leather comprises treating with product capable of forming an insoluble compound with the tanning agent and which is prepared by interaction of an amine, an aldehyde and a water-soluble polymeric amide. No. 2,205,355. Otto Grimm and Hans Rauch to Rohm & Haas Company.

In process for tanning skins, step comprising subjecting a skin to action of interpolymer of members of acrylic acid series. No. 2,205,882. George D. Graves to E. I. du Pont de Nemours & Co.

In process for tanning skins, step comprising subjecting skin to action of aqueous solution of polymethacrylic acid at pH about 4.8-5.7 and then increasing acidity. No. 2,205,883. George D. Graves to E. I. du Pont de Nemours & Co.

In process for tanning skins, steps comprising subjecting skin to action of an acidic polymeric material in which acidity is due to carboxyl groups, and then subjecting to action of soluble salt of metal selected from group consisting of Al, Fe, ti, Cu, and Cr. No. 2,205,901. Joseph S. Kirk to E. I. du Pont de Nemours & Co.

Metals, Alloys

Magnesium alloy containing .05-8% Al and 2-14 Bi, remainder being My. No. 2,205,567. Arthur Burkhardt and Richard Knabe to Georg Von Giesche's Erben.

Magnesium alloy containing 8-14% Al, 3-4% Bi, remainder being My. No. 2,204,568. Arthur Burkhardt and Richard Knabe to Georg Von Giesche's Erben.

Process for refining lead which contains bismuth. No. 2,204,651. Jesse O. Betterton and Yurii E. Lebedeff to American Smelting & Refining Co.

Continuous process for desulfurization of iron and steel. No. 2,204,813. Irving E. Muskat to Pittsburgh Plate Glass Company.

Recovery of bismuth from alkaline bismuthide dross containing lead. No. 2,205,387. Jesse O. Betterton and Yurii E. Lebedeff to American Smelting and Refining Co.

Method extracting nickel or cobalt by direct oxidation of their sulfides in aqueous solution containing one or more chlorine monoxide. No. 2,205,565. Alan Kissock.

Process for the production of magnesium. Nos. 2,205,658-2,205,659-2,205,660. Roy C. Kirk to The Dow Chemical Company.

Recovery of silver from spent photographic solutions. No. 2,205,792. Garnet Philip Ham to American Cyanamid Company.

Method for manufacturing titanium and alloys thereof. No. 2,205,854. Wilhelm Kroll.

A setting for diamonds composed of an alloy including about 26% Mo, 28% Cu, 46% Co. No. 2,205,888. Charles J. Koebel to Koebel Diamond Tool Co.

Method of refining clayey iron ores. No. 2,205,896. Hidesuke Yamagata.

Method concentrating magnesite ore by flotation. No. 2,205,923. Henry A. Doerner & Dwight L. Harris to State College of Washington Research Foundation.

Method of decarbonizing a carbon holding metal, for instance pig iron. No. 21,500. Ivar Rennerfelt.

Method forming protective coatings on magnesium and magnesium alloys. No. 2,206,028. Robert W. Buzzard.

Metal treating process. No. 2,206,064. John S. Thompson & Harold F. Bristol to The Patents Corporation.

Corrosion resistant copper-zinc alloy. No. 2,206,109. Wolf Johannes Müller & Moritz Niessner to Oesterreichische Dynamit Nobel Aktiengesellschaft.

Recovery of metal values from fume deposits. No. 2,206,117. William H. Osborn & Frank T. Crego to Phelps Dodge Corporation.

Method producing reaction mixture suitable for use in production of chromium alloys. No. 2,206,139. Marvin J. Udy.

Process of producing colored oxide coatings on nickel and nickel alloys. No. 2,206,392. Carl Girard Crocker & Robert R. Clappier to The International Nickel Company, Inc.

Process for obtaining pure chromium, titanium, and certain other metals and alloys thereof. No. 2,206,395. Samuel E. Gertler, one-half to Harry I. Stein.

Magnetic metallic material containing tungsten. No. 2,206,537. George Henry Stuart Price to The General Electric Co., Ltd.

Manufacture of very pure aluminum comprises directly heating aluminum ore containing oxygenated aluminum compound under far reaching vacuum and high temp., by metallic sulfide capable of reducing said oxygenated compound at temp. above temp. of volatilization of aluminum

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and condensing aluminum vapors evolved. No. 2,206,562. Henri Louis Gentil to Societe d'Electrochimie, d'Electrometallurgie et des Acieries Electriques d'Ugine.

Concentration of ores and other minerals by the sink and float process. No. 2,206,574. Andrew Pearson.

Method preparing relatively soft, tough high wear resistant osmium composition. No. 2,206,616. Andrew R. Devereux & Carl Pfanstiehl.

Method of forming an article of beryllium copper. No. 2,206,662. Leo C. Conradi & Harold F. Barnes to International Business Machines Corp.

Method for producing alloys containing iron and chromium. No. 2,206,711. Marvin J. Udy.

Alloy steels. No. 2,206,846-2,206,847. Clarence H. Lorig to Battelle Memorial Institute.

Method of and apparatus for reducing enriched iron ores. No. 2,206,973. Clarence Q. Payne.

Gravity separation of ores. No. 2,206,980. Henry H. Wade to Minerals Beneficiation, Inc.

Method treating metallic silicide or alloy comprising large proportions of silicon, comprises maintaining matter mass of said alloy or silicide in contact with a slag until practically all of said silicon carbide has entered said slag. No. 2,207,282. Joseph H. Brennan to Electro Metallurgical Company.

Method making copper-containing ferrous alloys. No. 2,207,350. Clarence H. Lorig & Harry B. Kinnear to Battelle Memorial Institute.

Alloy of following composition 18-40% Mo, 2-5% Mn, .25-.5% Ag and balance Ni. No. 2,207,380. Jacob Kurtz to Callite Tungsten Corp.

Separation of the constituents of alloys or mixtures of metals and/or elements similar to metals. No. 2,207,461. Paul Kemp.

Corrosion resistant and cold workable molybdenum steel. No. 2,207,554. Heinrich Reitz & Erich Hengler & Alfred Buttinghaus.

Paper and Pulp

Method coating continuous paper web to produce smooth surface finish. No. 2,204,600. Fred Kabela and George F. Whiting to Lowe Paper Company.

Apparatus for automatic pulp-density control. No. 2,204,644. James A. Adams to The Mine & Smelter Supply Company.

Digesting process and apparatus. No. 2,205,374. Thomas L. Dunbar to Chemipulp Process, Inc.

Improvement in method of treating pulps. No. 21,502. William Armor Stedman to The Dorr Company, Inc.

Process for removal of dirt from pulp. No. 2,207,218. Loren V. Forman; one-half to The Munising Paper Company.

Precipitation of starch upon fibers used in the manufacture of paper. No. 2,207,555. Ben W. Rowland to Stein, Hall Manufacturing Company.

Petroleum

Method acid treating oil wells to increase productivity. No. 2,204,580. Melvin De Groote to The Dow Chemical Company.

Compounded mineral oil containing metal salt of organic acid in amount to render oil corrosive to bearing metals and an organic ester present in sufficient amount to reduce corrosivity of oil. Nos. 2,204,597-2,204,598. Robert L. Humphreys and Victor N. Borsoff to Standard Oil Company of California.

Compounded mineral oil containing metal salt of organic acid in amount normally sufficient to increase corrosivity of mineral oil to bearing metals and small amount of organic hydroxy ester to reduce corrosivity of said compounded oil. No. 2,204,601. Frank W. Kavanagh and Victor N. Borsoff and Robert L. Humphreys to Standard Oil Company of California.

Method improving naphthenic lubricating oil comprising addition of an acyl halide and condensing resulting mixture by Friedel-Crafts catalyst. No. 2,204,609. Louis A. Mikeska to Standard Oil Development Company.

Lubricating composition comprising mineral oil, halogenated organic compound and sulfurized mineral oil. No. 2,204,620. Carl F. Prutton and Albert K. Smith to The Lubri-Zol Development Corporation.

Lubricating oil comprises petroleum oil containing small proportion of thiobenzophenone. No. 2,204,660. Robert Charles Cantelo to Sinclair Refining Company.

Lubricating oil comprises petroleum oil containing small proportion of heptadecyl phenyl thioketone. No. 2,204,661. Robert Charles Cantelo to Sinclair Refining Company.

Process catalystically polymerizing normally gaseous hydrocarbons containing olefins. No. 2,204,673. Stewart C. Fulton and Thomas Cross, Jr., to Standard Oil Development Company.

Vapor-phase process of polymerizing and removing undesirable constituents from gasoline. No. 2,204,685. Thomas B. Leech to Alcorn Combustion Company.

Process of solvent refining petroleum oils. No. 2,204,758. Arthur W. Hixson and Ralph Miller to The Chemical Foundation, Incorporated.

Process for desulfurizing mineral oils. No. 2,204,903. Donald S. McKittrick to Shell Development Company.

Process for lowering the pour points of mineral oils. No. 2,204,967. Franz Rudolf Moser to Shell Development Co.

Process for separating wax from wax-oil mixtures. No. 2,205,096. Vance N. Jenkins to Union Oil Company of California.

Motor fuel comprising gasoline and at least 25% of polymer blend comprising di-isobutylene and hydrogenated di-isobutylene. No. 2,205,107. Raphael Rosen to Standard Oil Development Company.

Process for the dehydrogenation of hydrocarbons. No. 2,205,141. Llewellyn Heard to Standard Oil Company of Indiana.

Process forming valuable compounds of higher molecular weight from normally gaseous olefins. No. 2,205,159. Donald R. Stevens and William A. Gruse to Gulf Research & Development Company.

Lubricant comprising mineral oil and small amount of an N-substituted p-aminophenol and an organic carboxylic acid of at least 6 C atoms. No. 2,205,164. Ralph R. Chappell and Rutger B. Colt and Denis McCormack to Bendix Aviation Corporation.

Process for conversion of normally gaseous hydrocarbons to normally liquid hydrocarbons. No. 21,487. Audley E. Harnsberger to The Pure Oil Co.

Process refining crude mineral oil distillates that are relatively low boiling and contaminated with mercaptan sulfur compounds. No. 2,205,410. Roscoe D. Howard to Petroleum Research Corporation.

Process refining relatively low-boiling petroleum distillates containing deleterious contaminants including sulfur compounds. No. 2,205,411. Roscoe D. Howard to Petroleum Research Corporation.

Method converting higher boiling hydocarbons into lower boiling hydrocarbons. No. 2,205,434. Edward D. Phinney to Process Management Company, Inc.

Method for converting hydrocarbon gases into liquids by polymerization at elevated temperature and pressure. No. 2,205,583. Cary R. Wagner to The Pure Oil Co.

Lubricant comprising major proportion of unchlorinated mineral oil and a minor amount of a compound incluyding a chlorinated fatty acid radical. No. 2,205,740. Julius A. Wunsch & Charles A. Marlies to The Lubri-Zol Development Corp.

Apparatus for the countercurrent extraction of hydrocarbon oil with a solvent. No. 2,205,986. Theodore A. Mangelsdorf, Charles T. Anne and Herman I. Wilson to The Texas Company.

Process separating normally gaseous olefins from normally gaseous saturated hydrocarbons. No. 2,205,996. Willem Rhijnvis van Wijk to Shell Development Co.

Method for catalytic cracking of hydrocarbon oil. No. 2,206,021. Ford H. Blunck to Standard Oil Company of Indiana.

Method for gas reversion comprises contacting a hydrocarbon charging stock boiling at 200-750° F. and a gas rich in at least one hydrocarbon having 2-4 C atoms per molecule simultaneous under high temp. with catalyst comprising boron oxide and aluminum oxide adsorbed on active silica. No. 2,206,055. Rodney V. Shankland to Standard Oil Company of Indiana.

Conversion of hydrocarbon oils. No. 2,206,071. Charles H. Angell to Universal Oil Products Co.

Conversion process for hydrocarbon oils. No. 2,206,135. Kenneth Swartwood to Universal Oil Products Company.

Process sulfurizing fatty and mineral oils. Nos. 2,206,151-2,206,152. Harry T. Bennett to Mid-Continent Petroleum Corp.

Method increasing flow of oil wells where inorganic deposits restrict the flow of oil, comprises introducing solution of HCl gas absorbed in liquid which is immiscible with water into the well. No. 2,206,187. Abraham M. Herbsman to Industrial Patents, Limited.

Lubricant composition comprising mineral lubricating oil and small amount of alkyl xanthic disulfide. No. 2,206,245. Elmer Wade Adams & George Mervin McNulty to Standard Oil Company of Indiana.

Process for non-destructive catalytic hydrogenation of olefins. No. 2,206,376. Johannes Cornelis Vlugter to Shell Development Company.

Process for cementing wells. No. 2,206,389. George E. Cannon to Standard Oil Development Company.

Production lubricating oil by polymerizing benzine hydrocarbons. No. 2,206,391. Carl Clar and Herbert Goethel to Ruhrchemie Aktiengesellschaft.

Lubricating oil comprising hydrocarbon oil and halogenated alcohol. No. 2,206,573. Bert H. Lincoln & Waldo L. Steiner & Alfred Henriksen (deceased) to The Lubri-Zol Development Corp.

Diesel fuel comprising hydrocarbon fuel oil, hydrogen persulfides, elementary sulfur in amount sufficient to decrease ignition delay period of the fuel. No. 2,206,594. Henry G. Berger, Richard S. George & Edwin M. Nygaard to Socony-Vacuum Oil Co.

Process for desulfurization of hydrocarbons. No. 2,206,921. Walter A. Schulze to Phillips Petroleum Company.

Production of mono-alkyl substituted compounds of meta-cresol from mixtures of meta- and para-cresols. No. 2,206,924. Donald R. Stevens & Joseph B. McKinley to Gulf Research & Development Co.

Hydrocarbon motor fuel comprising constituents normally tending to form gum and having incorporated therein to retard gum formation, dicyclohexyl-para-aminophenyl-tertiary amine. No. 2,207,163. Paul M. Ruedrich & Leslie H. Sharp to Tide Water Associated Oil Company.

Color stabilization of petroleum distillates by use of lecithin and wood phenolic distillate. No. 2,207,430. Robert E. Burk & Herman P. Lankelma to The Standard Oil Co of Ohio.

Manufacture of aromatic hydrocarbons from petroleum oil. No. 2,207,552. James W. Putt.

Method of refining waxy mineral lubricating oils. No. 2,207,693. Erich Saegebarth to Edeleanu Gesellschaft.

Pigments

Method for dispersion of pigments in film-forming vehicles. No. 2,205,985. Alexandre James Lapointe to Devoe & Raynolds Co., Inc.

Gypsum pigment and method of manufacture. No. 2,207,416. Lonnie W. Ryan & Winfred Joseph Cauwenberg to Interchemical Corporation.

Resins, Plastics, Etc.

Vinyl resin plastic compositions. No. 2,204,743. Victor Yngve to Carbide & Carbon Chemicals Corporation.

Transparent resin plastic formed by reaction of aldehyde on partially or wholly hydrolyzed polymerized vinyl ester plasticized with aliphatic acid ester of diglycerol. No. 2,205,020. Joseph D. Ryan to Libbey-Owens-Ford Glass Company.

Production high molecular condensation products by causing substance from group consisting of polyalcylene glycols and polyglycerines to react with substance containing at least 6 C atoms and selected from group consisting of aliphatic cycloaliphatic, and mixed aliphatics-aromatic mercaptans and of thiophenols and thionaphthols. No. 2,205,021. Hermann Schuette and Conrad Schoeller and Mannhiem, and Max Wittwer to I. G. Farbenindustrie Aktiengesellschaft.

Phenol-urea resin and method of making same. No. 2,205,427. Karl Loos.

Method treating vinylidene chloride polymers to increase tensile strength. No. 2,205,449. Ralph M. Wiley to The Dow Chemical Co.

Polymerization of vinylidene chloride. No. 2,206,022. Edgar C. Britton & Clyde W. Davis to The Dow Chemical Company.

Thermoplastic composition of rubber, a resin and rosin. No. 2,206,434. Hymen Shrager & Barney Shinberg to Atlas Shoe Products Corporation.

Method producing tough, machinable, cast resins. No. 2,206,906. Raymond L. Lunt.

Condensation products from an amine containing at least one hydroxyalkyl group and at least two amino nitrogen atoms on the one hand and at least one higher molecular organic acid substance on other hand. No. 2,206,928. Heinrich Ulrich & Joseph Nuesslein to I. G. Farbenindustrie Aktiengesellschaft.

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Coffee bean molding compound and process. No. 2,207,069. Herbert S. Polin.

Retarder for plastics and the like comprising hydrolyzed protein material and water repellent substance associated therewith in an amount substantially in excess of amount derivable from crude protein material hydrolized. No. 2,207,336. Nicholas S. Yanick to United States Gypsum Company.

Process rendering curable phenol aldehyde resin soluble in a varnish oil. No. 2,207,432. Karl H. Fulton & George L. Ball to Combustion Utilities Corp.

Dicyandiamide-formaldehyde resinous compositions. No. 2,207,442. Kurt Ripper to American Cyanamid Co.

Synthetic thermosetting resin composition consisting of reaction product of furfural with saturated oxy-naphthenic acid. No. 2,207,624. Donald D. Lee to Standard Oil Co. of California.

Synthetic thermosetting resin composition consisting of reaction product of furfural with saturated organic oxy-carboxylic acid. No. 2,207,626. Irving E. Levine & Donald D. Lee to Standard Oil Co. of Calif.

Rubber

Method preserving rubber by use of compound of formula $R\text{-}\overset{H}{N}\text{-}R'\text{-}\overset{X}{N}\text{-}R$ where R′ is arylene radical, R is aryl radical and X is of class of benzyl and alkyl groups containing more than 3 C atoms. No. 2,204,870. Robert L. Sibley to Monsanto Chemical Company.

Process vulcanizing rubber in presence of aryl thiazyl 2-selenide compound. No. 2,205,070. Winfield Scott to Wingfoot Corporation.

Method vulcanizing in presence of reaction product of dithio acid and halo ketone containing at least 3 halogen atoms substituted alpha to carbonyl group but with not more than 2 such halogen atoms on same C atom. No. 2,205,100. Joy G. Lichty to Wingfoot Corporation.

Method vulcanizing rubber in presence of product obtained by reacting sulfur and 2-amino benzothiazole at temp. 190-270° C. No. 2,205,101. Joy G. Lichty to Wingfoot Corporation.

Vulcanizing apparatus for continuous processing of strip stock of unlimited length. No. 2,205,112. Archibald L. Wallace to: one-half to Archibald L. Wallace and one-half to Cherryfield Corporation.

Electrical insulation comprising polymerized vinyl chloride and rubber hydrochloride intimately admixed to form homogeneous composition, in conjunction with mutual plasticizer for rubber hydrochloride and polymerized vinyl chloride. No. 2,205,654. Roy W. Ide, Jr. and Herbert A. Winkelmann to Marbon Corporation.

Process for production of synthetic rubber. No. 2,205,699. James Johnson Earshen.

Method preserving rubber comprising treatment with a secondary aryl decahydronaphthylamine. No. 2,206,433. Waldo L. Semon to The B. F. Goodrich Company.

Method making laminated rubber product. No. 2,206,441. Herbert A. Winkelmann & Eugene W. Moffett to Marbon Corporation.

Process producing softened rubber. No. 2,206,448. Warren F. Busse & Edward N. Cunningham to The B. F. Goodrich Company.

Method retarding deterioration of organic substance from oxidation by use of open chain aromatic amine. No. 2,206,454. David Craig to The B. F. Goodrich Company.

Manufacture of spongy and cellular products from rubbber and rubber-like materials. No. 2,206,757. Josef Anton Talalay.

Textiles

Method producing fibrous stock from woven waste materials. No. 2,205,666. Boris J. Petricoff to The Philip Carey Manufacturing Co.

Process for preparing delustered synthetic fibers and the like. No. 2,205,722. George De Witt Graves to E. I. du Pont de Nemours & Co.

Textile sizing. No. 2,207,229. Laurence R. Sherman to National Oil Products Company.

Process and composition for printing textile fabrics. No. 2,207,233. Franz Streng to General Aniline & Film Corporation.

Process for protecting protein fibrous materials. No. 2,207,630. Ruth E. Elmquist & Harry Rumfeld & James Kettering.

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Abstracts of Foreign Patents

Collected from Original Sources and Edited

By E. L. Luaces, Chemical and Patent Consultant

To assist those making use of this summary, it might be well to comment briefly on the system used by each of these countries in reporting patents.

Canada grants the patent on the date of publication. Printed copies are not obtainable, but typewritten certified copies may be obtained at a cost averaging about five dollars each.

English "patents" here reported are known as *Complete Specifications Accepted*. They are printed for distribution at a cost of ls. ld. each. They are subject to opposition by interested parties for a period of two months from date of publication.

French patents are granted several months before publication. Allowed applications are open to public inspection on payment of a fee, but no copies may be purchased nor notes made from the original. Printed copies of specifications are available to public several months after issue at 10 francs each, plus postage.

Belgian patents are granted several months before publication. No printed copies are available, but photostat copies may be obtained at a cost of from 3.5 to 4.5 francs per page.

In this digest the latest available data will be published as obtained from original sources. It will be readily understood that present conditions bring about delays in transportation and that for that reason the coverage will vary from month to month. We expect shortly to be able to begin publication of abstracts of German patents.

Present conditions make it impossible to obtain printed copies of photostats of French and Belgian patents, but this should shortly be corrected. We shall be glad to assist those interested in obtaining copies of Canadian and English patents. Your comments and criticism will be appreciated.

CANADIAN PATENTS

Granted and Published June 18, 1940

Solution for coating zinc or its alloys comprising the anions of phosphoric and nitric acids and the cations of zinc and nickel or cobalt. No. 389,413. American Chemical Paint Company. (Gerald C. Roming).

Cemented carbide composition containing less than 1% chromium carbide and the balance being 2-25% cobalt, and carbide material of tungsten, tantalum or titanium. No. 389,423. Canadian General Electric Company, Limited. (George Lucas).

Fertilizer nitrifying agent comprising a liquid containing formamide, dissolved free ammonia, urea and a relatively small quantity of water. No. 389,428. Canadan Industries, Limited. (John L. Brill).

Boron trifluoride associated with 1-5 mols of water per mol used in process involving organic condensation reactions of CO with olefines, alcohols or ethers. No. 389,429. Canadian Industries, Limited. (Donald J. Loder).

Preparing ethyl cellulose by emulsifying caustic soda and water in benzene, mixing granulated wood pulp with the emulsion, and reacting the mixture with ethyl chloride. No. 389,430. Canadian Industries, Limited. (Frederick C. Hahn).

Process for preparing ethers of penta-oxy fuchsone by axidizing leuco triphenylmethane derivatives with nitrites or peroxides. No. 389,441. Chinoin Gyogyszer és vegyészeti termékek gyara r.t. /Dr. Kereszty & Dr. Wolf/. (Zoltan Földi).

Separation of organic acids and boron fluoride by distillation under at least two different pressure stages. No. 389,449. E. I. du Pont de Nemours & Co., Inc. (Donald J. Loder).

Separating an organic compound from its complex with boron halide by adding an alkaline earth metal halide to free the organic constituent from the boron halide and form an alkaline earth metal halide-boron halide, separating the organic constituent, and subsequently the boron halide from the alkaline earth halide-boron halide complex. No. 389,450. E. I. du Pont de Nemours & Co., Inc. (Raymond F. Schultz).

In preparing pigmented polymerized methyl methacrylate, dissolving paraffin wax in pigment proportions but not over 2% by weight of total composition in monomeric methyl methacrylate, and then polymerizing said monomeric methyl methacrylate. No. 389,451. E. I. du Pont de Nemours & Co., Inc. (Barnard M. Marks).

Synthetic polyamide fibre exhibiting molecular orientation upon X-ray examination. No. 389,452. E. I. du Pont de Nemours & Co., Inc. (Wesley R. Peterson).

Polymeric monohydric alcohol esters of methacryloxy polycarboxylic aliphatic acids. No. 389,453. E. I. du Pont de Nemours & Co., Inc. (Daniel E. Strain).

Preparation of aliphatic carboxylic acids from a dehydrating agent, CO, and lower molecular weight olefinic hydrocarbon in presence of condensing agent comprising not more than 5 mols water per mol of boron fluoride. No. 389,454. E I. du Pont de Nemours & Co., Inc. (Donald J. Loder).

An imide of a polymeric alpha-hydrocarbon substituted acrylic acid having an aliphatic hydrocarbon radical of from 12-18 carbon atoms attached to the nitrogen atom. No. 389,455. E. I. du Pont de Nemours & Co., Inc. (George DeWitt Graves).

Reinforcement of rubber articles such as tires with threads, cords or fabrics prepared from continuous regenerated cellulose filaments. No. 389,456. E. I. du Pont de Nemours & Co., Inc. (Albert Hirschberger).

Toilet soap containing maple syrup as fixing and neutralizing agent. No. 389,475. Les Producteurs de Sucre d'Erable de Québec. (Isac Segal).

Vitamin bearing composition consisting essentially of fatty oil, glycerol, and a polyglycerol incompletely esterified with a higher fatty acid. No. 389,477. Mead Johnson & Company. (Raymond W. Barton and Warren M. Cox, Jr.).

Beta-alkylcholine halides wherein the alkyl radicals contain from 2-7 carbon atoms inclusive. No. 389,479. Merck & Co., Inc. (Randolph T. Major and Howard T. Bonnett).

Concentration of olefines in a mixture containing olefines and paraffins by fractionally distilling the mixture in presence of a polar oxygen containing compound of the group sulfur dioxide, ethylene oxide, and methyl formate. No 389,489. Phillips Petroleum Company. (Frederick E. Frey, Maryan P. Matuszak and Robert D. Snow).

Continuous sulfonation by bringing together streams of sulfonating agent and an aliphatic alcoholic hydroxy compound in full proportions required for degree of sulfonation desired, allowing sulfonation to proceed without restraining rise of temperature, and delivering reaction mixture to arresting treatment. No. 389,490. The Proctor & Gamble Company of Canada. Limited (Victor Mills).

Production of sulfonium sulfonates by reacting an aromatic sulfonic acid with an aliphatic monohydric primary alcohol at temperatures of 100-200°C. in presence of inert solvent. No. 389,499. Shell Development Company. (Adrianus J. van Peski and Johan M. Hoeffelmann).

Non-friable metallic catalyst comprising forming porous structure of an oxide of one heavy metal serving as support oxide of another heavy metal having higher affinity for oxygen, by heating mixture of second metal with oxide of first and reducing by means of reducing gases. No. 389,517. Henry Dreyfus. (Walter H. Groombridge and John E. Newns).

Hydrogen producing catalyst prepared by heating mixture of copper oxide and iron and reducing the metallic oxide to corresponding metals. No. 389,518. Henry Dreyfus. (Walter H. Groombridge and John E. Newns).

Catalytic production of sulfuric acid. No. 389,522. General Chemical Company. (Bernard M. Carter).

Method of preparing a component of ergot. No. 389,523. Eli Lilly and Company. (Marvin R. Thompson).

Granted and Published June 25, 1940

Controlling operation of vacuum box in papermaking machine by causing water extracted by the box from the web to create a working vacuum in said box of an intensity depending on character of web and volume of extracted water, and constantly maintaining a yielding throttling action on the water discharged from the box. No. 389,548. Ernest Poirier.

Reacting compounds of the general formula A-X-R-COOH wherein A is an aromatic radical, X stands for a member of the group consisting of O and S, R stands for a compound of the group consisting of hydrocarbon radicals and aliphatic radicals the carbon chain of which is at least once interrupted by O, with a member of group consisting of olefines, alcohols and halogenated hydrocarbons. No. 389,554. Gerhard Balle and Heinz Schild.

Preventing development of animal and "milk-pail" odors in protein compositions such as paints, films, etc., by incorporation a form of tetrachlorophenol therewith. No. 389,573. Canadian Gypsum Co., Ltd. (Alexander Adams).

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Photographic elements having thereon a resin coating selected from group of polyvinyl acetals and partially hydrolyzed polyvinyl acetates soluble in water at about 0-40°C. No. 389,574. Canadian Kodak Co., Ltd. (Thomas F. Murray, Jr. and William O. Kenyon).

Gelatine (photographic) layer containing as spreading agent an ester formed from a monobasic hydroxy acid and a higher fatty alcohol containing from eight to fifteen carbon atoms. No. 389,575. Canadian Kodak Co., Ltd. (George L. Boomer).

Treating a sensitive gelatino-halide emulsion layer by exposing to light image maintaining it at least 4 hours at 90° F. or more in atmosphere having relative humidity of at least 50% and then developing the image. No. 389,576. Canadian Kodak Co., Ltd. (John G. Capstaff).

Transparent anti-halation photographic element comprising a superficial coating of a dicarboxylic acid ester of agar. No. 389,578. Canadian Kodak Co., Ltd. (Carl J. Malm and John Emerson).

Producing a 1,4 ethylenic glycol by hydrogenating a 1,4 acetylenic glycol in presence of nickel catalyst activated with an alkaline alkali metal compound. No. 389,589. Carbide and Carbon Chemicals Corporation. (Thomas H. Vaughn).

Pressure transmission fluid comprising products resulting from chemical reaction of fatty acid ester-containing oleaginous material with a member of group consisting of polyalklene glycol mixtures and polyglycol monoethers, each containing at least 6 carbon atoms in the glycol radical. No. 389,590. Carbide and Carbon Chemicals Corporation. (Harvey R. Fife).

Replacing alcohol vapor in a gas under high pressure and at least 175° C. with water vapor by bringing the gas into intimate contact with preheated water at substantially the pressure and temperature of said gas. No. 389,591. Carbide and Carbon Chemicals Corporation. (Kenneth H. Rowlands and Rolf V. Wallin).

Producing a dialkyl acetylene by reacting upon an alkali metal carbide with successive small portions of a dialkyl sulfate while intimately intermixing the carbide and sulfate, and recovering the dialkyl acetylene thus produced. No. 389,592. Carbide and Carbon Chemicals Corporation. (Thomas H. Vaughn).

Preparing ketene by subjecting diketene vapor to pyrolysis at 400-800° C. to depolymerize the diketene and form gaseous mixture containing monomeric ketene. No. 389,593. Carbide and Carbon Chemicals Corporation. (Albert B. Boese, Jr.).

Culinary salt adapted to accelerate hydrolysis of food cooked therewith while preserving natural color and avoiding shrinkage, consisting of 5% sodium bicarbonate, 7% anhydrous trisodium phosphate, 10% anhydrous sodium sulfate and 78% sodium chloride. No. 389,594. Chemtex, Limited. (Frederick C. E. Harry and Henry H. York).

Laminated product comprising at least two laminae bonded to interlayer of synthetic linear condensation polymer which has intrinsic viscosity of at least 0.4. No. 389,603. E. I. du Pont de Nemours & Co., Inc. (Wallace H. Carothers).

Saline solution resisting austhenitic steel alloy containing 16-30% Cr, 7-20% Ni, 2-5% Mo, not over 4% Mn, not less than 1% Si, not over 0.2% C, and Cb at least 4 times but not exceeding 10 times the C content by over 1.5%; the balance Fe. No. 389,607. Electro Metallurgical Company of Canada, Limited. (Russell Franks).

Neoprene composition which has been vulcanized in presence of lead phthalate. No. 389,614. The B. F. Goodrich Company. (Richard A. Crawford).

Cell stimulating composition for use in treatment of infections comprising a water soluble chlorophyll compound dissolved in physiological salt solution. No. 389,629. Lakeland Foundation. (Benjamin Gruskin).

Granted and Published July 2, 1940

Embalming fluid comprising: 1 *chopine* (about 1 English pint. Ed.) formaldehyde, 1 ounce myrbaine oil, 2 ounces ether, ½ ounce oil of roses, 5 grams quinine sulfate. No. 389,669. Cécile Roy and Wilbrod Gaudreault.

Sizing rayon by applying in dilute form products obtained by oxidation of a semi-drying oil until resilient and insoluble products are obtained, but which are still sufficiently fluid to recover after deformation. No. 389,670. Jean Luria, Charles Luria, and Emile Luria.

In treating low molecular weight sulfocarboxylic acid ester of relatively high molecular weight alcohol, passing solution of a salt of such esters over a base exchange material to produce a different salt of said acid. No. 389,678. Benjamin R. Harris.

Anti-run treatment of hose by immersing in solution containing substantially equal proportions of rubber and wax and drying. No. 389,679. Charles Rapelje.

Photographic silver-halide emulsion containing at least one organic heterocyclic nitrogen base containing an alkyl group on the basic nitrogen atom and containing an acylmethylene group in the position adjacent to the basic nitrogen atom. No. 389,716. Canadian Kodak Co., Ltd. (Edward P. Davey).

Photographic gelatino-silver-halide emulsion containing a supersensitizing combination of at least one 2,4′-diethylthia-2′,4′-thiazinocyanine halides, together with at least one pseudocyanine halide. No. 389,717. Canadian Kodak Co., Ltd. (Burt H. Carroll).

Photographic gelatino-silver-halide emulsion containing a supersensitizing combination of 1-4-(1-piperidyl)-Δ1,3-butadienyl-beta-naphthothiazole ethiodide, together 1-(p-diethylaminostyryl)-benzothiazole. No. 389,718. Canadian Kodak Co., Ltd. (Burt H. Carroll and John A. Leermaker).

Photographic gelatino-silver-halide emulsion containing a supersensitizing combination of 2,2′,8-triethyl-5,6,5′,6′-dibenzoxacarbocyanine iodide together with 1-[(2-ethyl-2(1)-benzothiazolidene) methyl]-benzothiazole. No. 389,719. Canadian Kodak Co., Ltd. (Edward P. Davey).

Nitrating a sulfonic acid of 2-cyclohexyl phenol by gradually adding a dilute aqueous solution containing one molecular equivalent thereof to an aqueous solution containing at least 2.75 molecular equivalent of 50-70% nitric acid at temperatures gradually increasing from below 50° C. to 75-90° C. No. 389,730. Dow Chemical Company. (Ralph F. Prescott).

Making mixed molecularly dehydrated phosphates by reacting mixture of potassium and sodium chloride with phosphoric acid by heating to temperature sufficient to drive off substantially all of the water of constitution. No. 389,734. Hall Laboratories, Inc. (Everett P. Partridge).

Treating a cellulose-containing material with a paraffin emulsion to produce wrinkle-resistance and water repellency. No. 389,736. Heberlein Patent Corp. (Georges Heberlein).

Process and apparatus for decomposing ammonia using a catalyst. No. 389,739. Imperial Chemical Industries, Limited. (John L. Pearson).

Cetyl-oxy-methyl-pyridinium acid oxalate, being a crystalline solid soluble in warm water with an acid reaction to Congo. No. 389,740. Imperial Chemical Industries, Limited. (Henry A. Piggott).

Two-step method for bleaching textile with hypochlorite and hydrogen peroxide. No. 389,741. Imperial Chemical Industries, Limited. (Ernest Butterworth and Bertram-Pusey Ridge).

Producing nickel carbonyl by sintering nickel matte to produce granular sponge-like product, reducing with carbonaceous agent, and reacting reduced product with CO. No. 389,746. International Nickel Company, Inc. (Albert E. Wallis).

Stabilized crystals of ficin and process therefor. No. 389,754. Merck & Co., Inc. (Randolph T. Major and Alphonse Walti).

Production of amino carboxylic acids by ammonolysis of halogenated organic acid in presence of ammonium halide. No. 389,755. Merck & Co., Inc. (William H. Engels and Gustav A. Stein).

Alkali-earth metal salts of aryl esters of parahydroxybenzoic acid. No. 389,756. Merck & Co., Inc. (William H. Engels and John Weijlard).

Subjecting sulfonated material to extraction with halogenated organic solvent in presence of sulfonated fatty material to increase sulfur trioxide content thereof. No. 389,758. National Oil Products Co. (Bernard A. Dombrow and Ralph M. Beach).

Process for recovering alkyl phenols from petroleum distillate. No. 389,779. Shell Development Company. (Walter J. Hund, Samuel B. Thomas and Daniel B. Luten, Jr.).

Process for producing phthalic anhydride by catalytic oxidation of naphthalene. No. 389,780. The Solvay Process Co. (Frank Porter).

Process of producing nitrate and chlorine from nitric acid and a metal chloride. No. 389,781. Solvay Process Company. (Herman A. Beekhuis, Jr.).

Process for decomposing nitrozyl chloride. No. 389,782. The Solvay Process Co. (Herman A. Beekhuis, Jr.).

Granted and Published July 9, 1940

Treatment of filaments, fibres, etc., having basis of cellulose acetate by saponifying them by treatment with aqueous containing N-methyl cyclohexylamine. No. 389,820. Henry Dreyfus.

Product consisting essentially of ferric oxide, calcium oxide, sodium oxide and chromium trioxide and in which sodium oxide and calcium oxide are chemically combined with chromium trioxide in proportions providing equimolecular amounts of sodium chromate and calcium chromate. No. 389,843. Marion J. Udy.

Colored building board comprising vegetable fibres which gain color on exposure to light, a dye adapted to fade on exposure to light, a light resistant colored pigment, alum and size. No. 389,871. Canadian Gypsum Co., Ltd. (Joseph W. Gill).

Acid ester of phosphorus acid containing at least one naphthenyl radical. No. 389,872. Canadian Industries, Limited. (Paul L. Salzberg).

Homogeneous blend of rubber hydrochloride and a terpene hydrochloride. No. 389,879. Dominion Rubber Co., Ltd. (John McGavack).

Semi-stiff collar having fabric plies bonded together with thermoplastic cement containing methyl methacrylate. No. 389,881. E. I. du Pont de Nemours & Co., Inc. (John D. McBurney and Edgar H. Nollau).

Liquid oily non-resinous polymerizable polyhydric alcohol mixed ester of a polycarboxylic acid, a monocarboxylic acid of at least 12 carbon atoms, and methacrylic acid. No. 389,882. E. I. du Pont de Nemours & Co., Inc. (Leo P. Hubbuch).

Process for decarboxylation of a carboxylic group to a ketone. No. 389,883. E. I. du Pont de Nemours & Co., Inc. (Charles G. Wortz).

Preserving cellulosic fibres by forming slurry thereof, incorporating zinc and chromate ions therein, and heating. No. 389,884. E. I. du Pont de Nemours & Co., Inc. (Ernest R. Boller).

Reclaiming rubber by heating in presence of a thiophenol. No. 389,891. The B. F. Goodrich Company. (Benjamin St. J. Garvey.

Stabilizing vinyl acetal resin formed in presence of mineral acid catalyst by forming a suspension of the resin and subjecting it to action of methanol and neutralizing agent for catalyst. No. 389,906. Monsanto Chemical Company. (Joseph Dahle).

Chewing gum including activated carbon in amount not exceeding 4%. No. 389,912. Peter Paul, Inc. (Clarence H. Flint).

Vulcanizing rubber in presence of reaction product of 2-mercaptoarylthiazole and a halodioxane. No. 389,923. Wingfoot Corporation. (Albert M. Clifford).

Vulcanizing rubber in presence of cyclohexanonyl dimethyl dithiocarbamate. No. 389,924. Wingfoot Corporation. (Joy G. Lichty).

Vulcanizing rubber in presence of reaction product of a dithio acid and a halo ketone containing at least 3 halogen atoms substituted alpha to the carbonyl group but with not more than two such halogen atoms on the same carbon atom. No. 389,925. Wingfoot Corporation. (Joy G. Lichty).

Vulcanizing rubber in presence of product obtained by reacting sulfur and a 2-amino benzothiazole at temperature of 190-270° C. No. 389,926. Wingfoot Corporation. (Joy G. Lichty).

Vulcanizing rubber in presence of addition product of a diaryl guanidine and an alkyl iso thiocyanate. No. 389,927. Wingfoot Corporation. (George W. Watt).

Vulcanizing rubber in presence of a 2-arylene thiazyl-2-thio thiodiazole. No. 389,928. Wingfoot Corporation. (George W. Watt).

Preparing stable aqueous solutions of adcorbic acids by adding basis substances to solutions thereof in amount insufficient for neutralization and filling solution into containers in presence of inert gas and absence of oxygen. No. 389,930. Winthrop Chemical Company. Inc. (Carl L. Lautenschläger and Fritz Lindner).

Preparation of stable therapeutic product from intestinal mucous membranes. No. 389,931. Winthrop Chemical Company, Inc. (Fritz Lindner and Rudolf Rigler).

Preparing lactation promoting substance by extracting hypophysis anterior lobes at under 60° C. with water miscible organic solvent, extracting gland residue with water and then with aqueous alkaline solution of pH 8.0 to 12.0 and precipitating active substance from alkaline extract by acidification. No. 389,932. Winthrop Chemical Company, Inc. (Carl L. Lautenschläger and Willy Ludwig).

Oestrus-promoting substance derived from the anterior lobe of the hypophysis which is stable under storage and soluble in water and in physiological salt solution. No. 389,933. Winthrop Chemical Company, Inc. (Willy Ludwig).

Naval Stores, 1939-40

Statistics presented on these two pages, covering the seasons of 1939-40 and 1938-39, are taken from the annual report of the Bureau of Agricultural Chemistry and Engineering, U. S. Department of Agriculture, compiled by C. F. Speh, Naval Stores Research Division.

The Bureau believes and hopes that the new form of presenting these data will facilitate comparisons with the previous year. Beginning with this year, an attempt has been made to give separately the total consumption of gum and wood naval stores.

In considering the production figures, it should be borne in mind that gum naval stores production is seasonal. Normally, approximately 72% of the total annual gum crop is produced from April through September. Wood naval stores production, on the other hand, is not seasonal, but based largely upon estimated consumer demand. For this reason, figures for wood naval stores production are best compiled at the end of the crop year. The crop year extends from the first of April to the thirty-first of March in the following year.

Data have been included on reported production of sulfate wood rosin. The figures are given as 500-pound (gross weight) barrels and are the figures for resin acids reported or are derived from the reported production and stocks of crude liquid rosin, a mixture of fatty and resin acids.

Statistics reported are expressed in commercial units, for turpentine, barrels of 50 gallons, and for rosin, barrels of approximately 500 pounds gross weight. Where information was available, drums of rosin were converted to 500-pound barrels. These figures, compiled from government and other sources, are not represented as being exact or complete, but are the results of an effort to obtain reports on production at stills from each producer, and on distribution from dealers and consumers.

SUMMARY OF TURPENTINE

Supply Distribution and Carryover (Bbls. 50 gals.)
(By naval stores seasons, beginning Apr. 1 and ending Mar. 31)

	1939-40 12 mos. (Apr.-Mar.) Total	Gum	Wood	1938-39 12 mos. (Apr.-Mar.) Total	Gum	Wood
Supply and Distribution						
U. S. Carryover, Apr. 1	314,323	272,658	41,665	218,774	174,206	44,568
Production	604,778	382,781	221,997	709,218	534,291	174,927
Imports	16,492	16,492	.....	16,571	16,571	.....
Available Supply	935,593	671,931	263,662	944,563	725,068	219,495
Less Carryover Mar. 31	220,267	167,943	52,324	314,323	272,658	41,665
Appar. Total Consumption	715,326	503,988	211,338	630,240	452,410	177,830
Less Exports	238,438	189,684	48,754	210,226	174,909	35,317
Appar. U. S. Consumption	476,888	314,304	162,584	420,014	277,501	142,513
Carryover (Stocks)						
U. S. Carryover, Apr. 1	314,323	272,658	41,665	218,774	174,206	44,568
U. S. Carryover, Mar. 31	220,267	167,943	52,324	314,323	272,658	41,665
Increase	.....	.....	10,659	95,549	98,452	.....
Decrease	94,056	104,715	.....	.....	.....	2,903

SUMMARY OF ROSIN

Supply, Distribution and Carryover (Bbls. 500 lbs. gross)
(By naval stores seasons, beginning Apr. 1 and ending Mar. 31)

	1939-40 12 mos. (Apr.-Mar.) Total	Gum	Wood	1938-39 12 mos. (Apr.-Mar.) Total	Gum	Wood
Supply and Distribution						
U.S.Carryover,Apr.1.	1,621,970	1,399,124	222,846	999,347	765,580	233,767
Production	2,293,971[1]	1,317,795[1]	976,176	2,612,391[1]	1,832,930[1]	779,461
Imports	2,398	2,398	.....	340	340	.....
Available Supply	3,918,339	2,719,317	1,199,022	3,612,078	2,598,850	1,013,228
LessCarryover,Mar.31.	1,569,396	1,409,649	159,747	1,621,970	1,399,124	222,846
Appar. Tot. Consump.	2,348,943	1,309,668	1,039,275	1,990,108	1,199,726	790,382
Less Exports	975,880	588,845	387,035	821,381	499,206	322,175
Appar. U.S. Consump.	1,373,063	720,823	652,240	1,168,727	700,520	468,207
Carryover (Stocks)						
U.S.Carryover,Apr.1.	1,621,970	1,399,124	222,846	999,347	765,580	233,767
U.S.Carryover,Mar.31.	1,569,396	1,409,649	159,747	1,621,970	1,399,124	222,846
Increase	.....	10,525	.....	622,623	633,544	.....
Decrease	52,574	.....	63,099	.....	.....	10,921

[1] Includes reclaimed gum rosin.

Estimation of Average Prices

Monthly prices of gum turpentine were obtained by averaging the Wednesday and Saturday closing prices. The season average was obtained by multiplying each monthly price by the combined reported receipts during that month (at Savannah, Ga., Jacksonville and Pensacola, Fla.), and dividing the total of these figures for the season by the total receipts for that season, thereby giving the months of heavy receipts and of low receipts their proper relative values.

Monthly prices of gum rosin were obtained by multiplying the average of the Wednesday and Saturday prices of each grade by the number of barrels of each

Details of Production

(By naval stores seasons, beginning Apr. 1 and ending Mar. 31)

	1939-40 12 mos. (Apr.-Mar.) Total	Gum	Wood	1938-39 12 mos. (Apr.-Mar.) Total	Gum	Wood
Production of Turpentine (Bbls. 50 gals.)						
Gum	382,781	382,781	.....	534,291	534,291	.....
Wood, Steam Dist.	158,575	.....	158,575	129,091	.....	129,091
" Sulfate	56,631	.....	56,631	40,467	.....	40,467
" Dest. Dist.	6,791	.....	6,791	5,369	.....	5,369
Total	604,778	382,781	221,997	709,218	534,291	174,927
Production of Rosin (Bbls. 500 lbs. gross)						
Gum	1,278,527	1,278,527	.....	1,792,951	1,792,951	.....
Reclaimed (Gum)	39,268	39,268	.....	39,979	39,979	.....
Wood, Steam Dist.	949,343	.....	949,343	762,913	.....	762,913
" Sulfate	26,833	.....	26,833	16,548	.....	16,548
" Dest. Dist.	.....	.....	.....	.....	.....	.....
Total	2,293,971	1,317,795	976,176	2,612,391	1,832,930	779,461

Naval Stores, 1939-40

Production, Distribution, Carryover—p. 10

grade reported as inspected in Florida during that month, and dividing the total of the resulting figures by the total number of barrels inspected in Florida during that month, thereby giving the proper relative value to each grade. The season average was determined in the same manner as was that of gum turpentine.

Wednesday's and Friday's closing Savannah prices were used for December, January and February for 1936-37 and 1937-38. Friday's prices were used for 1938-39 and 1939-40 when there was no quoted Saturday market.

Sources of Data

Prices, Florida inspections and monthly receipts at Savannah, Jacksonville and Pensacola are taken from the Naval Stores Review and Journal of Trade, daily market reports of the Savannah Exchange, Jacksonville and Pensacola Chambers of Commerce. These market statistics are prepared by the Economic Analysis Unit, General Crops Section, Agricultural Adjustment Administration.

Details of Carryover

Carryover (stocks) figures, on this page, do not include turpentine or rosin producible from crude gum or crude wood turpentine on hand. Probably, in but few instances are the figures for carryover, as well as for production, to be considered as complete and final. Reports on stocks and production are obtained at stills from each producer and on consumption and stocks from dealers and consumers.

Stocks of turpentine and rosin are separated into gum and wood products, but wood rosin data do not include, in this case, so-called "B wood rosin."

Foreign Situation

Statistics on foreign production, stocks and exports have been omitted because of lack of availability of complete and accurate data.

For comparison with earlier periods refer to Statistical and Technical Data Section, p. 113, July, 1937; p. 119, January, 1938; p. 697, December, 1938; p. 623, November, 1939; p. 767, December, 1939 and p. 119, January, 1940.

To be continued.

DETAILS AND SUMMARY OF TURPENTINE CARRYOVER (Bbls. 50 gals.)

(At close of naval stores season, on March 31)

	1940 Mar. 31 Total	1940 Mar. 31 Gum	1940 Mar. 31 Wood	1939 Mar. 31 Total	1939 Mar. 31 Gum	1939 Mar. 31 Wood
Details of Turpentine Carryover						
Production Points						
Gum Stills[1]	7,778	7,778	.....	16,858	16,858	.....
Wood Plants[1]						
Steam Dist.[2]	23,104	.....	23,104	13,026	.....	13,026
Sulfate	4,929	.....	4,929	6,238	.....	6,238
Dest. Dist.	1,093	.....	1,093	652	.....	652
Total	36,904	7,778	29,126	36,774	16,858	19,916
Sou. Concent. Points						
Savannah[3]	9,822	9,822	.....	37,639	37,639	.....
Jacksonville[3]	36,278	36,278	.....	44,454	44,454	.....
Pensacola[3]	10,735	10,735	.....	27,533	27,533	.....
Other Sou. Ports	17,637	17,637	.....	63,114	63,114	.....
Interior Yards	51,823	51,823	.....	49,270	49,270	.....
Total	126,295	126,295	.....	222,010	222,010	.....
Distrib. Points						
Eastern	10,824	5,205	5,619	10,410	5,658	4,752
Central	25,181	16,488	8,693	21,991	13,224	8,767
Western	4,728	2,720	2,008	6,130	3,842	2,288
Total[4]	40,733	24,413	16,320	38,531	22,724	15,807
Industrial Plants[5]	16,335	9,457	6,878	17,008	11,066	5,942
Summary of Turpentine Carryover						
Production Points	36,904	7,778	29,126	36,774	16,858	19,916
Sou. Concent. Points	126,295	126,295	.....	222,010	222,010	.....
Distrib. Points	40,733	24,413	16,320	38,531	22,724	15,807
Industrial Plants	16,335	9,457	6,878	17,008	11,066	5,942
Total in U. S.	220,267	167,943	52,324	314,323	272,658	41,665
At and afloat to London	.....[6]	.....	.....	25,050	.....	.....
Total U. S. and London	.....	.....	.....	339,373	.....	.....

[1] Compiled from reports by producers and factors.
[2] Does not include by-products resulting from making paler grades from FF wood rosin.
[3] Official Board of Trade and Chamber of Commerce reports.
[4] Compiled from reports of individual distributors.
[5] Compiled from reports of individual consumers.
[6] Not available.

Details and Summary of Rosin Carryover (Bbls. 500 lbs. gross)

(At close of naval stores season, on March 31)

	1940 Mar. 31 Total	1940 Mar. 31 Gum	1940 Mar. 31 Wood	1939 Mar. 31 Total	1939 Mar. 31 Gum	1939 Mar. 31 Wood
Details of Rosin Carryover						
Production Points						
Gum Stills[1]	32,283	32,283	.....	137,597*	137,597	.....
Wood Plants[1]						
Steam Dist.[2]	94,030	.....	94,030	152,042	.....	152,042
Sulfate	2,994	.....	2,994	5,201	.....	5,201
Dest. Dist.	.....	.....	.....	.....	.....	.....
Total	129,307	32,283	97,024	294,840	137,597	157,243
Sou. Concent. Points						
Savannah[3]	166,509	166,509	.....	281,882	281,882	.....
Jacksonville[3]	318,861	318,861	.....	261,099	261,099	.....
Pensacola[3]	53,193	53,193	.....	65,107	65,107	.....
Other Sou. Ports	223,564	223,564	.....	242,716	242,716	.....
Interior Yards	432,326	432,326	.....	201,685	201,685	.....
Total	1,194,453	1,194,453	.....	1,052,489	1,052,489	.....
Distrib. Points						
Eastern	7,610	2,716	4,894	9,450	3,989	5,461
Central	7,047	3,674	3,373	8,696	6,081	2,615
Western	1,554	793	761	1,031	513	518
Total[4]	16,211	7,183	9,028	19,177	10,583	8,594
Industrial Plants[5]	229,425	175,730	53,695	255,464	198,455	57,009
Summary of Rosin Carryover (Stocks)						
Production Points	129,307	32,283	97,024	294,840	137,597	157,243
Sou. Concent. Points	1,194,453	1,194,453	.....	1,052,489	1,052,489	.....
Distrib. Points	16,211	7,183	9,028	19,177	10,583	8,594
Industrial Plants	229,425	175,730	53,695	255,464	198,455	57,009
Total in U. S.	1,569,396	1,409,649	159,747	1,621,970	1,399,124	222,846

[1] Compiled from reports by producers and factors.
[2] Does not include by-products resulting from making paler grades from FF wood rosin.
[3] Official Board of Trade and Chamber of Commerce Reports.
[4] Compiled from reports of individual distributors.
[5] Compiled from reports of individual consumers.

TECHNOLOGY DEPT

WE MAKE IT CLEAR

Warner Caustic Soda has made it clear to many prominent users that paying a price premium for caustic soda is an unnecessary production expense.

Warner Textile Grade Caustic Soda has no turbidity. Its salt content is low. Its iron content is as low, or lower, than any caustic soda made by any method.

Warner Caustic Soda is furnished in standard 50% and 70% concentrations – as well as in 73% concentration shipped in specially lined tank cars. Also flake or solid. Why not order a car for prompt shipment?

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Tetra Sodium Pyrophosphate
Acid Sodium Pyrophosphate
Phosphoric Acid
Sodium Phosphates
Liquid Caustic Potash
Chlorine, Liquid
Sulfur Chloride
Trichlorethylene
Barium Carbonate
Perchlorethylene
Carbon Bisulfide
Sodium Sulfide
Bromine
Blanc Fixe
Carbon Tetrachloride
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Chemical Grade Magnesia

CHEMICAL WARNER COMPANY

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